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VOL. IX. PARTS 1 TO 6.

GENERAL INDEX.

A.	Page.	C.	Page.
A Few Alien Plants, Records of ...	228	Cabbage Moth, Remedies against the ...	204
A Good Idea for a Nose-bag ...	232	Cairns, Orange-growing at ...	110
A Good Tomato for Home Gardens ...	133	Cane, Predaceous Enemies of ...	229
A Natural Remedy for Worms and		Cane Crop, Molasses as a Manure for a	165
Blood Diseases of Stock ...	48	Cane-grub Investigation ...	24, 72, 115, 229
A Princely Contribution to the Mackay		Cane Rats, Remedy against ...	157
Cyclone Fund from Bangkok, Siam	186, 207	Carob, Algaroba, or Locust Beans ...	71
A Remarkable Fowl Fatality and a		Cattle, In-breeding of ...	173
Poison Plant ...	141	Cattle, Tick-resistant ...	171
A Saw Gin, Work of a ...	234	Chaff Bagger, Pook's Patent ...	234
A Scale-feeding Millipede ...	25	Chillie Sauce, To Make ...	35
A Short Description of Varieties of		Chillie Vinegar, To Make ...	35
Maize and Sorghums ...	197	Chillies, To Pickle ...	34
About Maize and Oats—A Word to		Chutney, Mango ...	94
Farmers ...	233	Cockroaches, To Destroy ...	71
Agricultural College Dairy Herd	11, 63, 104,	Compost Heap, The Value of the ...	207
	138, 173, 210	Correspondents, Answers to ...	77, 157, 234
Agricultural College Egg-laying Com-		Cost of Cotton-growing per Acre in	
petitions ...	15, 51, 98, 139, 174, 211	Texas ...	167
Agricultural Districts, Rainfall in the	31, 80,	Cotton and Maize in the Roma District	4
	123, 160, 188, 237	Cotton Bonus ...	77
Agricultural Societies, List of	ix., 74, 120,	Cotton-growing in Texas, Cost of, per	
	ix., 185, 233	acre ...	167
Agriculture ...	1, 37, 85, 127, 161, 195	Cotton-growing. The Profits of ...	1
Algaroba, Carob, or Locust Beans ...	71, 94	Cotton Notes (Gin History) ...	2
Alien Plants, Records of ...	228	Cotton, Outlook for 1918 ...	44
Analyses of Samples of Ensilage kept		Cotton Plant as a Factor in Bee-farm-	
for Different Periods in Sealed Tins...	195	ing ...	226
Animal Pathology ...	124	Cotton Plant as a Honey Producer ...	227
Announcements, Departmental ...	xvi., ix.,	Cotton Plant from Seed to Maturity ...	231
	xiii., xxiii., xiii.	Creole Pickles ...	35
Answers to Correspondents ...	77, 157, 234	Cultivation of the Potato ...	37, 85
Apiary Notes ...	22	Curing Hams and Bacon ...	157
Apiculture ...	17, 21, 45, 226	Curing Meat ...	231
April, Farm and Garden Notes for ...	124	D.	
Arsenic, Killing Green Timber with ...	113	Dairy Cattle, In-breeding of ...	173
Astronomical Data ...	32, 84, 126, 164, 192	Dairy Herd, Queensland Agricultural	
Atherton Tableland, Weeds and		College ...	11, 63, 104, 138, 173, 210
Poisonous Plants of the ...	147	Dairying ...	11, 63, 104, 138, 173, 210
Australia, What She Owes to Great		Damaged Grain, Treatment of ...	167
Britain ...	230	Departmental Announcements ...	xvi., ix., xiii.,
B.			xxiii., xxiii., xiii.
Bacon and Hams—Home-curing ...	157	Destroying Cockroaches ...	71
Beans, Algaroba, Carob, or Locust ...	71, 94	Destruction of Insect Pests of the	
Bee-farming, Cotton Plant as a Factor		Tomato ...	64
in Bees and Grapes ...	45	Determination of the Keeping Qualities	
Bees—To Prevent them Swarming ...	16	of Ensilage ...	195
Blow-fly Trap ...	136	E.	
Botany ...	22, 71, 147, 180, 228	Egg-laying Competition, Queensland	
Bran, Rice ...	27	Agricultural College ...	15, 51, 98, 139, 174, 211
Breeders of Pure-bred Stock ...	8, 46, 95, 134,	Enoggera Sales ...	31, 80, 123, 160, 188, 237
	169, 208	Bridge, a Wire, To Construct ...	9
British Army ...	77		

	Page.
Ensilage, Experiments to Determine the Keeping Qualities of	186, 195
Entomology	24, 72, 115, 182, 229
Ettersburg Strawberry	163
Excavated Silos	233
Experiments in Connection with the Destruction of Insect Pests of the Tomato	64
Experiments in Trapping the Queensland Fruit Fly	182
Experiments to Determine the Keeping Qualities of Ensilage	195

F.

Farm and Garden Notes for—	
January, Vol. viii.	320
February, Vol. ix.	33
March	81
April	124
May	161
June	189
July	238
Farm Produce, Prices of, in the Brisbane Markets	29, 78, 121, 158, 186, 255
Farmers and Taxation	132
Fertiliser, The Oxley	233
Forestry	113
Fowl Fatality	141
Fruit Fly, Experiments in Trapping the	182
Fruit, Prices of, in the Turbot Street Markets	30, 79, 122, 159, 187, 236
Fruit, Prices of, in the Southern Markets	30, 79, 122, 159, 187, 236

G.

Gardening, Market	45, 133, 204
General Notes	74, 120, 185, 231
Goats and their Management	11
Grape-Growers, Hints to	23, 68, 112, 178
Green Timber, Killing, with Arsenic	113
Gun-fire and Rainfall	83

H.

Hens, Non-productive	176
Hints to Grapegrowers	23, 68, 112, 178
Hints for Establishing a Vineyard	179
Home-curing Hams and Bacon	157
Home Gardens, A Good Tomato for	133
Home-made Night Light	23
Horseshoe Nails, Rusted, To Clean	75
How Much Does a Rabbit Eat?	97
How to Tin Iron Utensils	14

I.

Illustrated Notes on the Weeds of Queensland	22, 180
In-breeding of Dairy Cattle	173
India's Share in the Rice Trade of the World	69
Industries, Tropical	69
Insect Pests of the Tomato, Destruction of	64
Iron Utensils, How to Tin	14
Italy, Pickling Olives in	145

J.

June, Farm and Garden Notes for	139
July, Farm and Garden Notes for	238

K.

Killing Green Timber with Arsenic	113
-----------------------------------	-----

L.

Land, Measuring, without Instruments	185
Laying Strains (Poultry)	102
List of Agricultural Societies	ix., 74, 120, ix., 185, 233
Log Timber, Measuring	172
Lucerne "Don'ts"	14

M.

Mackay Cyclone, A Princely Contribution from Bangkok	186, 207
Maize, Varieties of	197
Mango Chutney	94
March, Farm and Garden Notes for	81
March, Orchard Notes for	82
Market Gardening	45, 133, 204
Markets	29, 78, 121, 158, 156, 235
May, Farm and Garden Notes for	161
May, Orchard Notes for	162
Measuring Land without Instruments	185
Measuring Log Timber	172
Meat, Curing of	231
Meat Preservative—Sugar	145
Millipede, A Scale-feeding	26
Mint, Possibilities in	45
Molasses as a Manure for a Cane Crop	165
Mustard, White	42
Mysterious Disease in Stock	234

N.

Natural Remedy for Worms or Blood Diseases of Stock	48
Night Light, A Home-made	28
Non-productive Hens	176
Norit Process of Manufacturing White Sugar	183
Nose-bag, A Good Idea for a	232
Notes, Farm and Garden—	
January, Vol. viii.	320
February, Vol. ix.	33
March	81
April	125
May	161
June	189
July	238
Notes, General	74, 120, 185, 231
Notes on Potato Cultivation	37, 85
Notes on Rat Traps	76
Notes, Orchard	33, 82, 124, 162, 191, 239

O.

Of Interest to Viticulturists	207
Old Tires, To Repair	232
Olive-growing	18
Olives, Pickling, in Italy	146

GENERAL INDEX.

	Page.
Once-over Tiller	4
Onion-growing in North Queensland	7
Orange-growing at Cairns	110
Orchard	18, 64, 105, 146, 239
Orchard Notes	33, 82, 124, 162, 191, 239
Ovens, Solar	62
Oxley Fertiliser	233

P.

Pastoral	7, 46, 95, 134, 169, 208
Pickles, Creole	35
Pickling Chillies	35
Pickling Oranges in Italy	146
Pook's Patent Chaff Bagger	234
Possibilities in Mint	45
Potato Cultivation	37, 85
Poultry	15, 51, 98, 139, 174, 211
Poultry Houses	53
Poultry Industry	143
Practical Hints for Establishing a Vineyard	179
Predaceous Enemies of Sugar-cane Grubs	229
Prices of Farm Produce in the Brisbane Markets	29, 78, 121, 158, 186, 235
Prices of Fruit in the Southern Markets	30, 79, 122, 159, 187, 236
Prices of Fruit in the Turbot Street Markets	30, 79, 122, 159, 187, 236
Prices of Vegetables in the Brisbane Markets	29, 78, 121, 158, 186, 235
Prickly-pear as a Fodder for Stock	119
Problems in Wheat Storage	167
Produce Agency, Queensland State	166
Profits of Cotton-growing	1
Prospects of the Rice Industry	17
Pure-bred Stock, Breeders of	8, 46, 95, 134, 169, 208

Q.

Queensland Agricultural College Dairy Herd	11, 63, 104, 138, 173, 210
Queensland Agricultural College Egg-laying Competitions	15, 51, 98, 139, 174, 211
Queensland, Astronomical Data for	32, 84, 126, 164, 192
Queensland Fruit Fly, Experiments in Trapping	182
Queensland, Illustrated Notes on the Weeds of	22, 180
Queensland State Produce Agency	166

R.

Rabbits, How Much do they Eat?	97
Rainfall and Gun-fire	83
Rainfall in the Agricultural Districts	31, 80, 123, 160, 188, 237
Rare Marsupial	117
Records of a Few Alien Plants	228
Remarkable Fowl Fatality	141
Remedy against Cane Rats	157
Remedy for Worms and Blood Diseases of Stock	48
Report on Cane Grubs and Predaceous Enemies of Cane	229
Rice Bran	28
Rice Industry, Prospects of the	17
Rice Trade of the World, India's Share in the	69
Roma District, Cotton-growing in the	4
Roses, Soapsuds and Sulphur for	22
Rusted Horseshoe Nails, To Clean	75

S.

Sales, Enoggera	31, 80, 123, 160, 188, 237
Saman Tree	156
Saw Gin, Work of a	234
Scale-feeding Habits of a Porto Rico Millipede	26
Seasonable Notes on Potato Cultivation	37, 85
Seed Selection, Utility of	196
Seed, Tobacco	234
Seed Wheat for Disposal	127
Sheep Maggot Fly Pest	137
Show Dates of Agricultural Societies	74, 120, ix., 185
Silos, Excavated	233
Snails, To Protect Plants from	186
Soapsuds and Sulphur for Roses	22
Societies, Agricultural	ix., 74, 120, ix., 185, 233
Solar Ovens	62
State Produce Agency	166
Statistics	31, 80, 123, 160, 189, 237
Stock, Breeders of Pure-bred	7, 46, 95, 134, 169, 208
Stock, Natural Remedy for Worms or Blood Diseases of	49
Sorghums, Varieties of	197
Southern Fruit Markets	30, 79, 122, 159, 187, 236
Strawberry Culture	105
Strawberry, The Ettersburg	168
Sugar as a Meat Preservative	145
Sugar, White, Norit Process of Manufacturing	183
Sunrise and Sunset in Queensland	32, 84, 126, 164, 192, 237
Sugar-cane Crop, Molasses as a Manure for	165

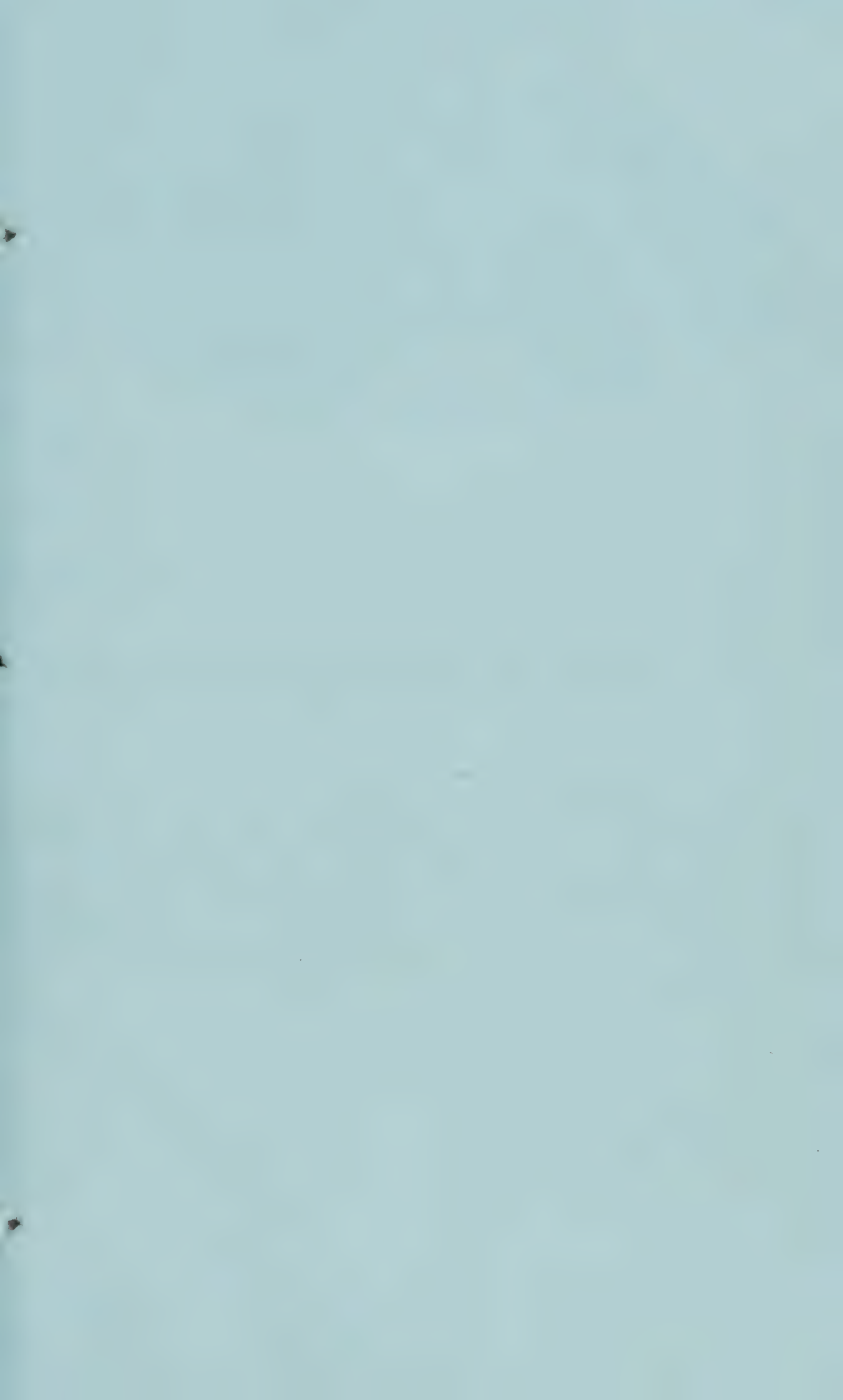
T.

Taxation and the Farmers	132
Texas, Cost of Growing Cotton in	167
The Algaroba and Locust Beans	94
The British Army	77
The Cotton Outlook for 1918	44
The Ettersburg Strawberry	168
The Norit Process of Manufacturing White Sugar	183
The "Once-over" Tiller	4
The Poultry Industry	143
The Profits of Cotton-growing	1
The Value of the Compost Heap	207
The Saman Tree	156
Tick-resistant Cattle	171
Times of Sunrise and Sunset	32, 84, 126, 164, 192, 240
Tinning Iron Utensils	14
Tobacco Seed	234
To Clean Rusted Horseshoe Nails	75
To Construct a Wire Bridge	10
To Make Chillie Sauce	35
To Make Chillie Vinegar	35
To Pickle Chillies	35
To Prevent Bees Swarming	17
To Protect Plants from Snails	186
To Repair Old Tyres	232
Tomato, A Good	133
Trap for the Blow-fly	137
Trap-nests	100
Traps, Rat, Notes on	76
Tree, The Saman	156
Tropical Industries	69
Tyres, Old, To Repair	232

U.		Page.	W.		Page.
Unproductive Hens	...	176	Weeds and Poisonous Plants of the		
Utility of Seed Selection	...	196	Atherton Tableland	...	147
Utility <i>v.</i> Fancy Breeds of Poultry ...	...	101	Weeds of Queensland	22,	180
V.			What Australia Owes to Great Britain	...	230
Value of the Compost Heap	...	207	Wheat, Seed, for Disposal	...	127
Varieties of Maize and Sorghums ...	...	197	Wheat Storage Problems	...	167
Vegetables, Prices of, in the Brisbane			When the Clock Stops	...	73
Markets 28, 78, 121, 158, 186,	235		White Mustard	...	42
Vineyard, Practical Hints for Estab-			White Sugar, The Norist Process of		
lishing a	...	179	Manufacturing	...	183
Vines: Resistant Stocks	227, xiv.		Wire Bridge, To Construct a	...	10
Viticulture 23, 68, 112, 178,	227		Work of a Saw-gin	...	234
Viticulturists, Of Interest to	...	207	Worm and Blood Diseases of Stock, A		
			National Remedy for	...	48

INDEX TO ILLUSTRATIONS.

	Page.		Page.
Cotton at Orallo, Roma District ...	5	Types of Wheats	129-131
Maize at Orallo, Roma District ...	6	Saman Tree	156
Onion Grown near Mackay	7	Mossman River Grass	181
Olive-tree at Westbrook	19	Types of Maize Varieties	197
Twiggy Mulcin	23	Maize—	
Poultry Houses	53-62	Improved Yellow Dent	198
Cleaning Rusted Horseshoe Nails ...	75	Star Leaming	199
Simple Rat Trap	76	Boone County White	200
Potato-planting Machine	91	Brazilian White	201
Potato Grader	93	The Small Cabbage Moth; Its Work ...	204
Strawberry Garden at Mooloolah ...	108	The Cocoon and Adult	205
General View of a Navel Orange		Winning Birds at the Final Egg-lay-	
Orchard at Cairns	111	ing Competition, 1918, at the Queens-	
A Pouched Mouse	119	land Agricultural College	215



QUEENSLAND AGRICULTURAL JOURNAL

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PART 1.

Agriculture.

THE PROFITS OF COTTON-GROWING.

Mr. Daniel Jones, who is one of the oldest cotton-growers in the State, writing to the *Brisbane Courier* of 28th November, on the returns received for the crop of 1917, said:—

“ If the returns appear dazzling, they do not reach what was won out of the black soils in the Ipswich districts fifty years ago. Neither have the prices paid equalled that which growers have realised for some varieties of cotton grown in the North during the past fifteen years.* *Re* cost of tillage, that has been reiterated by me until tired of doing it. Suffice it to say that anyone who elects to farm, and who cannot grow a crop of cotton to harvest for $\frac{1}{2}$ d. per lb., and pick it for another $\frac{3}{4}$ d., had better not engage in farm pursuits. I have always urged that this vocation is a family one; hence no labour question comes into the arena.

“ Cotton needs handling much as dairying, save that in the case of cotton it is not the drudgery, making, as a witness averred before the Interstate Commissioner lately, white slaves of the family. In my inquiries, growers state that 100 lb. to 150 lb. of fibre can be picked in a day.† This, at $\frac{3}{4}$ d. per lb., whether it be juvenile or adult labour, means a fair wage.

* This was not Uplands; but the valuable Caravonica cotton evolved by Dr. Thomatis at Cairns.

† Until we can evolve a cotton which will, like wheat or maize, mature the bolls all at the same time, the first and last pickings will be comparatively small; but in the height of the season pickers can, in a day of eight hours, pick from 100 lb. and even up to 200 lb.—Editor, “Q.A.J.”

“ If the cotton industry were dependent on child labour, I would roundly condemn it. Cost of tillage and picking should not exceed £5 per acre ; the balance is profit. In the instances quoted, the lowest return was for 2 acres, £10 17s. 1d. (an untilled plot) ; the highest, £24.

“ In scrub areas cotton can be sown after a burn for 15s. an acre, as in most districts, during the first season, the undergrowth does not show, and no tillage is required. On forest areas 30s. an acre is sufficient to win a crop. This, with picking added, indicates the costs and profit, basing the price on last season's crop—viz., 3.58d. per lb.

“ I have watched a picker gather 58 lb. of fibre in two hours. A smart hand, allowing an average of 1,000 lb. per acre, should control up to 12 to 14 acres without help in the season—about six months' work.”

COTTON NOTES.

GIN HISTORY.

Under this caption B. L. Leach, in “Cotton and Cotton Oil News,” Texas, U.S.A., 13th August, 1917, discusses the cost and returns of cotton-gin plants in localities where cotton is a mere “ fill-in ” crop, and states that it has been proved that they have been unprofitable investments from the fact that probably less than 25 per cent. of the plants so located are operated at a profit, operation being based on an average of years.

The variation of the cotton acreage from year to year, where diversified farming is the rule, is a problem which the ginowner cannot consistently combat.

This condition, or uncertainty of cotton acreage, is wholly responsible for the much too keen competition in the ginning industry.

It is unqualifiedly repeated that competition is the “ life ” of trade, but when applied to the ginning business in diversified farming regions, competition has proven to be the “ death ” of trade. This statement can be easily verified by a look around at the numerous idle gin plants which were constructed during the years of large cotton acreages, by persons foreign to the actual conditions.

The keen competition which now exists, coupled with the rapid deterioration of gin plants, the uncertainty of acreage, excessive insurance protection, the elevated prices of all necessities in connection with the operation of the gin, and the very short period of operation, constitute a condition which, in the end, will mean still greater financial losses to the ginning business unless the present prevailing charge for ginning cotton is materially increased.

The present charge ($\frac{1}{4}$ d. per lb.) for ginning and wrapping a bale of cotton is to the ginner as 7 cents per lb. is to the producer. The farmer can not afford to produce cotton for 7 cents per lb., and the ginner cannot continue in business and gin for 50 cents per 100.

The producer expects the ginner to begin operation at the time the “first bale” arrives, which, as a general rule, is the latter part of August, and as cotton-picking is not general before the latter part of September, the gin is operated the first month in the season at a considerable loss. This is also true of the last month of the season.

When we take into consideration that there are only three months in the year (October, November, and December) during which time the ginner can expect to operate at a profit, it is plain to be seen why gin plants, as a whole, are losing investments.

The cotton-producer expects the ginner to equip his gin with the latest machinery, keep the plant in the best of repair, and gin the cotton with as little delay as possible. He has a right to demand as much; yet, in exacting the best service, the farmer should not object to the ginner charging a price for that service that will afford him a legitimate profit on the investment.

The average gin plant represents an investment of approximately 8,000 dollars.* Eight or nine months of the year the plant is idle.

The average life of the gin is probably less than ten years, depending somewhat upon the conditions under which it is operated. Depreciation, therefore, is a very important factor and one that is not given the necessary consideration by many operators. Interest on the investment, taxes, and insurance are other very important fixed expenses, and the four fixed charges just mentioned are perpetual in their accumulation regardless of whether the plant is operated or standing idle.

The above expenses may be properly termed "incidental," since their accumulation is certain and must be provided for, even though the plant is not operated.

Let us now reduce these expenses to actual "experience" figures in order to more easily grasp their importance: Assuming the average gin plant to represent a valuation of 8,000 dollars we find the incidental expenses to be—

	Dollars.		
Depreciation, at 10 per cent. per year	800		
Interest, at 10 per cent. per year	800		
Insurance, at 3 per cent. per year	240		
Taxes, at 2 per cent. per year	160		
Total incidental expenses	2,000		

Again repeating, for the sake of emphasis, the ginner must provide for the above charge of 2,000 dollars regardless of whether or not he operates or allows his gin to stand idle.

We will now discuss, for sake of comparison, the source of the ginner's anticipated income.

The average ginner, in the locality under discussion, will probably gin in a season approximately 1,000 bales, yet the majority do not reach this figure.

	Dollars.		
Received for ginning, 1,000 bales of cotton, average weight, 500 lb.	4,000		
Less cost of bagging and ties, at 1 dollar 25 cents (1917 prices)	1,250		
Gross profit from gin	2,750		
300 tons seed purchased; average net profit 2 dollars ton	600		
Total gross income for season	3,350		

* To convert dollars into British currency roughly, divide the figures given by 5.

OPERATING EXPENSES.

	Dollars.
Manager's salary for year	1,200
Clerical and labour	1,000
Fuel, oils, &c.	750
Stationery and advertising	300
Repairs and general expense	300
Total operating expenses	3,350

While the above figures are estimated, yet they are based on actual experience. The fact which we wish to prove by them is that a gin will not pay more than actual operating expenses from ginning 1,000 bales of cotton.

The amount of seed handled by a gin will vary materially from year to year, depending on the market price and competition from street buyers, yet the net profit of 2 dollars per ton is approximately correct unless the ginner speculates in cotton-seed, in which event he will be in the hands of chance.

We believe the figures above will stand up under the assault of the severest critic; yet we are open for any concrete proof to the contrary.

COTTON AND MAIZE IN THE ROMA DISTRICT.

Our illustration shows a fine field of Russell's Big Boll Cotton, grown in November, 1916, by Mr. E. A. Thomas, of Llanellay, Orallo, Roma district, from seed supplied by the Department of Agriculture and Stock.

The second photograph shows a portion of a field of maize grown by Mr. Thomas, near Euthulla, along the proposed line to Injune Creek. The variety is Early Yellow Dent, the seed of which was also obtained from the Department.

"ONCE-OVER" TILLER.
PRACTICAL DEMONSTRATION.

At Miramar, Wellington, lately, a practical demonstration was given of the latest American invention in farm machinery. The "once-over" tiller, the invention in question, is manufactured in Minneapolis, and the machine exhibited was imported by Messrs. Hope Gibbons Sons and J. B. Clarkson, Ltd. The machine is quite a new affair, and was only seen in England for the first time in July last. At the demonstration there was quite a representative gathering. His Excellency the Governor-General and the Countess of Liverpool were present, as also were the Minister of Finance (Sir Joseph Ward), the Minister of Agriculture (the Hon. W. D. S. MacDonald), and representatives of leading business firms in touch with farmers, engineers, experienced farmers, and practical ploughmen.

The principle on which the "once-over" works is simple. It is a rotary tiller, and consists of a standard American sulky plough, horse-driven, and with a seat provided for the ploughman. Alongside the ploughshare is a vertical pulveriser—that is, a number of knives after the style of a sausage-mincer. As the plough turns up the soil it falls against the rotating knives which pulverise it. The pulveriser is worked by a motor machine, and the horses have merely to draw the plough along. For this new machine it is claimed that its operations are the equivalent of ploughing, cultivating, and harrowing the land in one operation. The pulveriser was hampered by the sods on grass land, but on stubble land it did excellent work. Sir Joseph Ward acted as ploughman for once round the paddock, and was filmed by the Picture Supplies Company.

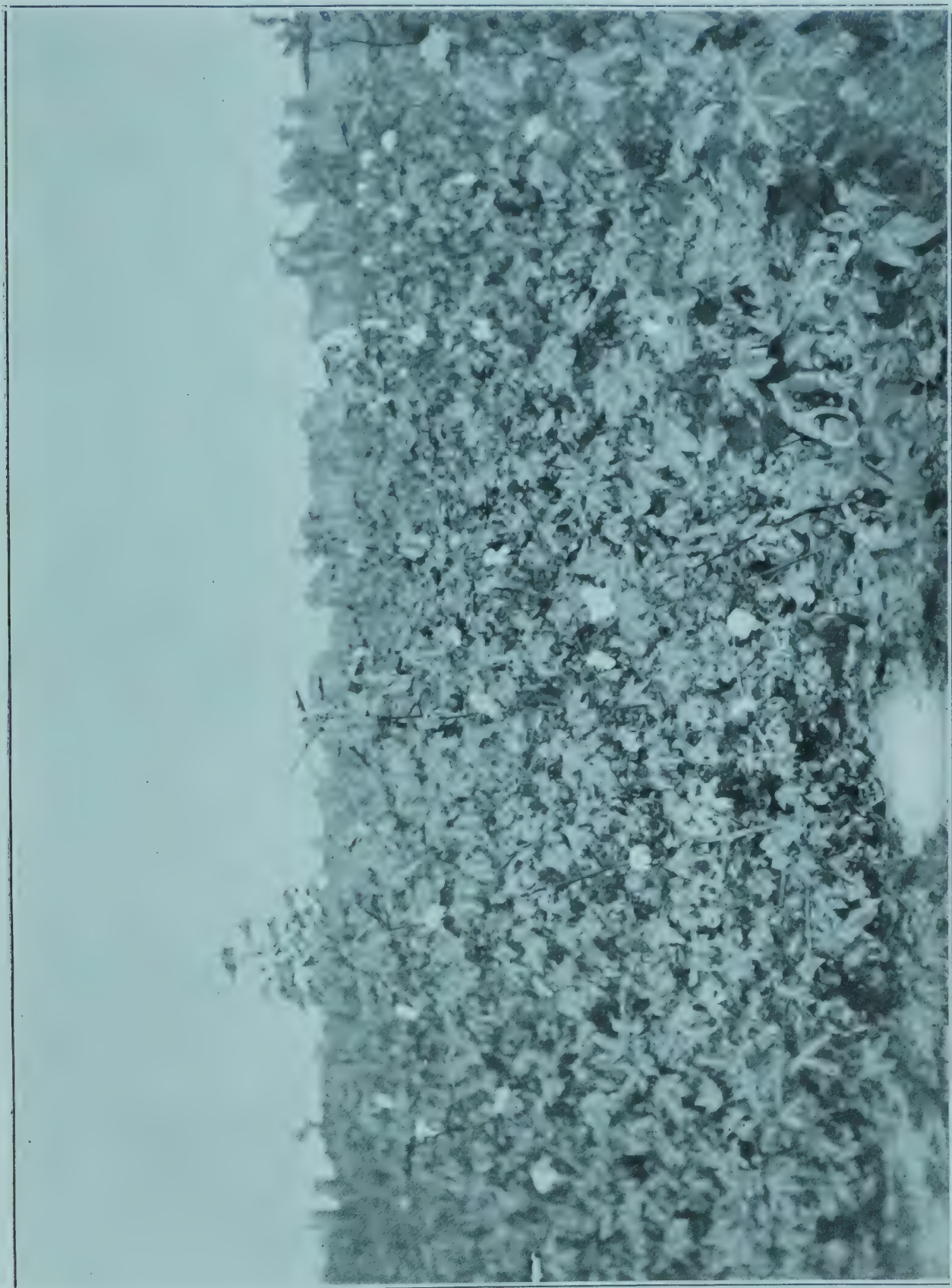


PLATE 1.—COTTON GROWN BY MR. ERNEST A. THOMAS AT ORALLO, ROMA DISTRICT.



PLATE 2.—MAIZE GROWN BY MR. ERNEST THOMAS AT ORALLO, ROMA DISTRICT. HEIGHT, 11 FT. 6 IN.

ONION-GROWING IN NORTH QUEENSLAND.

We have received from Mrs. McDermott, Kinhora, St. Helens, which is situated half-way between Mackay and Proserpine, a sample, here illustrated, of a very fine onion, which appears to be of the same variety which was grown in large quantities at Oxley Creek in the sixties from seed imported from Spain by Mr. Martindale. At that time onions were worth from £60 to £80 per ton. This specimen weighed 1 lb. 5 oz. It would be interesting to know what the returns were per acre.



PLATE 3.—ONION GROWN BY MRS. McDERMOTT, KINHORA, ST. HELENS,
NEAR MACKAY. WEIGHT, 1 LB. 5 OZ.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The following revised list of breeders of purebred cattle is published for the purpose of informing those who desire to improve their stock where the best cattle can be obtained in the State. The Department of Agriculture and Stock takes no responsibility in relation to the entries in the list; but, when inquiries were first made, the condition was imposed that the entries were to be only of stock that had been duly registered, or that were eligible for registration in the different herd books. The entries received were, in some cases, somewhat too confusing for proper discrimination, it has, therefore, now been decided that only such cattle as have been registered will be included. The lists previously published in the *Queensland Agricultural Journal* have now been withdrawn for revision.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
F. C. G. Gratton ..	"Towlestone," Kingsthorpe	2	14	Holstein Cattle Club Herd Book
T. Mullen	"Norwood," Chelmer	3	20	Queensland Jersey Herd Book
J. H. Paten	Yandina	6	21	Ayrshire Herd Book of Queensland
Queensland Agricultural College	Gatton	4	38	Ayrshire Herd Book of Queensland
		..	2	Ayrshire Herd Book of Scotland
		2	9	Holstein-Friesian Herd Book of Australia
		2	31	Jersey Herd Book of Queensland
J. W. Paten	Wanora, Ipswich ..	10	42	Ayrshire Herd Book of Queensland
M. W. Doyle	Moggill	4	12	Queensland Jersey Herd Book
G. A. Buss	Bundaberg	1	15	Herd Book of the Jersey Cattle Society of Queensland
W. Rudd	Christmas Creek, Beaudesert	2	10	Milking Shorthorn Herd Book of Queensland
M. F. and R. C. Ramsay	Talgai, Clifton ..	5	27	Herd Book of the Jersey Cattle Society of Queensland
George Newman ..	Wyreema	9	37	Holstein-Friesian Herd Book of Australia
R. Conochie	Brooklands, Tingooia	9	21	Queensland Jersey Herd Book

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
W. J. Barnes	Cedar Grove	10	37	Queensland Jersey Herd Book
T. B. Murray-Prior ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
W. J. Affleck	Grasmere, N. Pine ..	6	31	Queensland Jersey Herd Book
A. J. McConnel	Dugandan, Boonah	19	36	Australian Hereford Herd Book
A. Pickels	Blackland's Stud Farm, Wondai	4	62	Illawarra Dairy Cattle Herd Book of Queensland
G. C. Clark	East Talgai, Ellinthorp	3	7	New Zealand Herd Book
H. D. B. Cox	Sydney (entered brother's name)	3	16	Commonwealth Standard Jersey Herd Book
J. T. Perrett and Son	Coolabunia	2	36	Illawarra Herd Book of Queensland
State Farm	Kairi	4	8	Ayrshire Herd Book of Queensland
		1	2	Holstein-Friesian Herd Book of Australia
		45	127	Australian Hereford Herd Book
E. M. Lumley Hill ..	Bellevue House, Bellevue	1	12	Illawarra Herd Book of Queensland
W. F. Savage	Ramsay	50	400	Australian Hereford Herd Book
Tindal and Son	Gunyan, Inglewood	3	28	Queensland Jersey Herd Book
J. N. Waugh and Son	Prairie Lawn, Nobby	9	55	Ayrshire Herd Book of Queensland
J. H. Fairfax	Marinya, Cambooya (2)	25	100	Queensland Shorthorn Herd Book
C. E. McDougall	Lyndhurst Stud, Warwick (2)	6	20	Ayrshire Herd Book of Queensland
J. Holmes	"Longlands," Pittsworth	1	20	Illawarra Dairy Cattle Association
P. Biddles	Home Park, Netherby	1	9	Milking Shorthorn Herd Book
A. Rodgers	Torran's Vale, Lane-field	1	..	Holstein-Friesian Herd Book of Queensland
R. S. Alexander	Glenlomond Farm, Coolumboola	2	..	Holstein-Friesian Herd Book of Australia
		3	83	Ayrshire Herd Book of Queensland
State Farm	Warren	2	15	Holstein Cattle Club Herd Book
S. H. Hosking	Toogooloowah	1	2	Queensland Jersey Herd Book
W. J. H. Austin	Hadleigh Jersey Herd, Boonah	..	6	Commonwealth Standard Herd Book
Ditto	ditto	7	21	Ayrshire Herd Book of Queensland
H. M. Hart	Glen Heath Stud, Yalangur	3	9	Holstein-Friesian Herd Book of Queensland
C. Behrendorff	Inavale Stud Farm, Boonah	25	77	Ayrshire Herd Book of Queensland
F. A. Stimpson	Ayrshire Stud Farm, Fairfield, South Brisbane	5	21	Ayrshire Herd Book of Australia
M. L. Cochrane	Paringa Farm, near Cairns			

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
Albert Cook	"Greenmount," Mackay	1	8	A.-A. Stud Book, New Zealand
Thomas Brown	"Bellgrove," Kingaroy	1	14	Do.
Higgins Bros.	Sandy Creek, Leslie, Q.	6	2	Do.
Calcino Bros.	"Summariva," Charleville	3	4	Do.
W. M. McKelvie	"Undulla," Miles ..	5	4	Do.
James Connors	"Glen Erin," Nanango	1	2	Do.
J. A. Mackintosh	"Yundah," Warwick	2	8	Do.
M. J. Luff	Kaimkillenbun ..	1	1	Do.
A. Spencer	Brisbane	2	1	Do.
Beak Pastoral Co.	Rockhampton ..	2	10	Do.

TO CONSTRUCT A WIRE BRIDGE.

"Osmiridium," writing to the "Papuan Courier," describes a method of building a wire bridge across a stream which, he says, combines many advantages over the old-fashioned plan, such as was some years ago thrown over the crossing of the North Pine River. His plan is cheaper, less wire is used, and anyone handy with tools can erect it. Also, the person using it would have no balancing to do, as he would simply be a "plumb-bob" under the wire. Following is the specification of material required for the bridge:—

Wire bridge for span of 100 ft.: Main $\frac{5}{8}$ -in. wire rope to rest on "pig-stye" at each end and then go on to anchor frames at lower level than the bridge wire. Cage to be 4 ft. long, 2 ft. 6 in. wide, and 3 ft. deep, made of light timber and hardwood frame, set in two slings of either wire chain or iron, and suspended from hooks on two wheeled runner blocks on main wire. Cage to be operated by a small windlass fixed in cage to iron plumper blocks and the side of cage. Line for hauling cage across to be an endless $\frac{1}{4}$ -in. wire rope running through 3-in. pulley-blocks at level of main wire and spragged at one end. The bottom end of endless wire takes two or three turns around windlass barrel in cage, and cage will work across on turning windlass handle. Hooks on traveller blocks should be of steel, and tested to half a ton. Main wire can be strained either with union screws or Spanish windlass on to anchor frames. Weight: 200 ft. $\frac{5}{8}$ -in. steel wire rope, allowing a working strain of 3 tons, 120 lb.; endless rope for hauling cage, 200 ft., 20 lb.; two 3-in. pulley-blocks, 10 lb.; travelling blocks, 15 lb.; cage (estimated), 75 lb.; total weight material, if Spanish windlass used, 240 lb. If 200-ft. span required only 80 lb. extra weight would be necessary. Travelling blocks require two hooks (safety) on which to suspend cage, and they want to be 2 ft. apart from centre to prevent cage twisting.

Such a bridge would be very handy in flood times in Queensland, where travellers are often stuck up for days on the banks of a billabong owing to the depth and rush of water at the usual crossing-places, not to speak of the dangers of attempting to cross when big snags are being carried along the streams.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RETURNS OF COWS FROM 27TH OCTOBER TO 26TH NOVEMBER, 1917.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Sweet Meadows ...	Jersey ...	8 Aug., 1917	599	6.3	44.73	
Iron Plate ...	" ...	14 Oct. "	889	4.1	42.82	
Nina ...	Shorthorn...	6 Sept. "	968	3.7	41.96	
Auntie's Lass ...	Ayrshire ...	5 July "	965	3.6	40.71	
College Damsel ...	Holstein ...	12 July "	956	3.6	40.33	
Lady Melba ...	" ...	14 Feb. "	836	3.9	38.26	
Lilia ...	Ayrshire ...	11 July "	749	4.2	36.97	
Hedge's Dutchmaid	Holstein ...	9 Sept. "	926	3.4	36.80	
Miss Bell ...	Jersey ...	27 June "	599	5.2	36.79	
Violette's Peer's Girl	" ...	26 Oct. "	589	5.1	35.47	
Netherton Belle ...	Ayrshire ...	17 July "	730	4.0	34.28	
College Bluebell ...	Jersey ...	28 June "	730	4.0	34.28	
Lady Dorset ...	Ayrshire ...	14 Aug. "	782	3.7	33.89	
Lady Annette ...	" ...	19 Oct. "	711	4.0	33.39	
Burlesque ...	Jersey ...	8 Oct. "	518	5.4	33.07	
Netherhall Queen	Ayrshire ...	30 June "	865	3.2	32.28	
Kate						
Princess Kate ...	" ...	28 June "	663	4.1	31.92	
Thornton Fairetta	Jersey ...	30 June "	512	5.2	31.45	
Songstress ...	Ayrshire ...	1 Oct. "	684	3.9	31.29	
Miss Betty ...	Jersey ...	27 Mar. "	556	4.7	30.80	
Lady Loch II.	Ayrshire ...	3 June "	698	3.7	30.25	
La Hurette Hope	Jersey ...	22 Aug. "	538	4.7	29.81	
Prim ...	Holstein ...	3 Aug. "	883	2.9	29.77	
Rosine ...	Ayrshire ...	21 June "	632	4.0	29.68	
Buttercup ...	Shorthorn...	2 June "	753	3.3	29.01	
Skylark ...	Ayrshire ...	24 May "	598	4.1	28.80	
Confidence ...	" ...	25 June "	682	3.6	28.76	
College Mermaid...	Jersey ...	21 Aug. "	456	5.3	28.54	
Lady Mitchell ...	Holstein ...	26 Sept. "	743	3.0	25.93	
Leonie ...	Ayrshire ...	4 Sept. "	597	3.7	25.88	
Snowflake ...	Shorthorn...	17 May "	509	4.2	25.13	
Miss Edition ...	Jersey ...	25 Dec., 1916	540	3.9	24.71	
Miss Security ...	Ayrshire ...	27 Mar., 1917	551	3.8	24.54	
Windyhill Davidina	" ...	2 July "	568	3.4	22.56	
Hedge's Madge ...	Holstein ...	22 Mar. "	488	3.9	22.32	

GOATS AND THEIR MANAGEMENT.

We have been asked by a correspondent to continue the subject of goat-keeping, which has already been dealt with in several issues of the Journal. The limits of this Journal will not permit of a very lengthy article on the matter, but the following are the main features of the business as laid down by H. S. Holmes-Pegler in an exhaustive article on the subject, published last year in "Live Stock on the Farm," edited by Professor C. Bryner Jones, M. Sc., F.H.A.S., London:—

SELECTION OF A BREED.

If utility is the one object apart from appearance, the Swiss (Toggenburg and Saanen) are to be preferred, also the Anglo-Swiss, which is a cross between the best breeds as regards quantity of milk. The next best cross to this would be the Anglo-Nubian-Swiss, which means further crossing with goats having "milking blood" in their veins, being generally that of animals which have made themselves conspicuous at shows as milkers. If price is an important matter, or appearance, the Anglo-Nubian will answer the purpose well. The chief merit of Swiss goats is the large quantity of milk they almost invariably yield.

CONDITIONS SUITABLE FOR GOAT-KEEPING.

The chief recommendation for goat-keeping is the facility with which goats may be accommodated, whilst the same benefits are derived, in a small way, as those obtained from dairy stock on the larger scale. In the first place, pasturage, though an advantage in some cases, is by no means necessary, and, unless it be extensive, is an absolute disadvantage, for goats kept long on this same grass without a change of herbage, in time, contract disease and die off. The goat, indeed, in spite of its propensity to roam, accommodates itself readily to the stall-feeding system, and, given the run of a yard, will often do better stall-fed than one that is pastured. In many instances, goats are kept to advantage without even this yard; but a garden is almost a *sine qua non* if this animal is to be maintained economically. Hence, a mere shed—if nothing better is available—and a vegetable garden will enable anyone to keep a goat or a couple; and it is advisable to have two, for various reasons. In the first place, the supply of milk for a household can be continued for a longer period, providing that the two come into profit at different times; and secondly, they do better in company, being sociable animals, whilst the trouble of feeding and milking is not much more for two than for one.

THE GOAT HOUSE.

Although a mere shed is mentioned as sufficient in an emergency to start with, most people prefer to build a proper goat house. Any disused stable or cow house or some outbuilding, with very little arrangement of the interior, can be adapted to the wants of a goat. A needful accommodation is a raised bench, 3 feet long by 2 feet wide, which can be used for the goat to lie on, or on which it may stand to be milked. The latter is most necessary.

Goats have a dislike to damp in any form, and will always prefer a plain board or two, at a short elevation from the floor, to the most inviting bed of straw or other litter on the ground. A hay-rack is the next necessity, and here two important points should be observed. Goats are wasteful creatures in their food if they have facilities given them for being so, and they can destroy as much hay as a pony will eat if the hay-rack is not suitably constructed to counteract this. With this object, the bars of the rack must be placed $1\frac{1}{2}$ inch apart, and the rack itself should be raised to such a height from the ground that the animal has to stand on its hind legs to reach the contents.

STABLES.

A loose box in a well-ventilated stable, where sunshine can enter, especially if a horse is kept under the same roof, makes capital accommodation. Goats like company, and will generally fraternise with other animals, especially horses and cows.

FEEDING AND CARE OF GOATS.

Goats are not always the hardy animals that they are popularly supposed to be, and this is greatly on account of the way they are fed. Like other stock, or, indeed human beings, the more highly they are fed the more liable they are to disease.

GARDEN PRODUCE AS FOOD.

Goats are capable of utilising and transferring into splendid milk a quantity of material which would, in most cases, be wasted. Garden produce is here chiefly referred to, although the kitchen can also furnish some portion of the ration, such as dried crusts of bread and peelings of vegetables, or even remnants of porridge and cooked potatoes.

Amongst the garden refuse are potatoes and pea haulms, the latter being stored and given dry, also clippings of trees at pruning time. Grass may be given, but it must be absolutely fresh, and must not be trampled on. Soiled grass no goat will touch—they will almost starve first. The tops or leaves of vegetable like carrots, parsnips, Jerusalem artichokes, and many weeds such as thistles, brambles, &c., are always acceptable. Goats are very fond of barking trees, and fresh-cut branches of suitable trees may be thrown into the yard.

For dry food, a moderate quantity of hay and corn should form part of the daily ration to maintain the milk supply. Oats should be preferred to maize, as the latter is not so digestible as the former, and is too heating. The guiding principle in feeding goats to get a good yield of milk is to give as great a change as possible. As these animals chew the cud, they require to have as much as is necessary to fill the stomach, and then to be left quiet for a time to masticate and digest it.

When goats are stall-fed, they should be fed four times a day, beginning at 7 in the morning, continuing at 11 and 4 p.m., and at 7 or 8 in the evening.

Goats rarely drink water except in very hot, dry weather. It should, however, be offered them twice a day when stall-fed. The water must be absolutely fresh, and given in a perfectly clean bucket. Salt is a necessary adjunct to food. Goats delight in licking a lump of rock salt.

COST OF FEEDING A GOAT.

In England, the cost of feeding a goat when supplies have to be bought is reckoned by the writer at 2½d. per day, or at 2d. a day where there is a garden. The cost would, to some not very great extent, be higher in Queensland if everything in the way of food had to be bought; but the vegetable garden here, producing all the year round, would keep expenses down.

AGE FOR MATING.

Goats breed at a very early age. Good stock is often begotten by kids of six or seven months old; but it is better to wait for a year before mating.

MILKING A GOAT.

A goat should be milked twice a day at least after the kids are weaned. Regularity in the hours of milking is of great importance, for if a goat is milked at all hours, it is detrimental to the supply. Feed a goat when milking her. It keeps her attention fixed on her food instead of on the process that she is being subjected to, and she stands quieter in consequence. Milk her on a raised bench.

YIELDS OF MILK.

“What quantity of milk does a goat yield?” is a very common question. I may, on this point, take occasion to mention that it is not wise to accept as gospel all the statements that are made by goat-keepers, especially when a goat is offered for sale. In correspondence with an American on this point, I ventured to express the opinion on the statement that a certain goat in America was reputed to yield 6 quarts a day, which I regard as impossible for any goat to give. I suggested that possibly the quart in America was a smaller measure than that in England. To this, the American replied:—“It is true our quarts are not as large as your quarts, but we have the same-sized liars.”

The ordinary supply from a common goat in full profit is from 2 to 3 pints a day—occasionally 4 pints. But numbers of goats in England have given over 1 gallon a day. In all show records weight and not measurement of milk is given, as the latter is deceptive on account of froth which can make a pint and a-half look like a quart when first drawn. Take, however, the following equivalents:—One gallon of milk is equal, roughly, to 10 lb.; therefore, 2 quarts will equal 5 lb.; 1 quart, 2½ lb.; and 1 pint, 1¼ lb. or 20 oz. This is actually the weight of water, whilst the specific gravity of milk is a fraction more, but 10 lb. is near enough for the purpose. Several goats in England gave from 8 lb. 4 oz. to 12 lb. 3 oz. per day; and one goat, “Leazes Eve,” fifteen weeks after the birth of her kids, gave nearly half a ton of milk.

PROFIT IN GOAT-KEEPING.

Although the demand for goats is enormous in England, that for goat's milk is practically nil; consequently, until there is such a demand, goat-farming can never pay as a matter of business. But for household purposes there is much profit.

An ordinary goat will yield milk, on an average, for the first three months she is in profit at the rate of 3 pints daily, and during the next three about half this quantity; whilst in the last quarter she will only supply ¾ pint daily. This brings the total to 240 quarts. The value of this, at 4d. per quart (in England), is £4. If a Toggenburg Swiss, or the right kind of Anglo-Nubian be kept, however, the yield for the first quarter should be at the rate of 2 quarts daily; for the second, 3 pints; and for the third (though it may extend to another month), 1½ pint, giving a total of 384 quarts, which, at the same valuation, would be worth £6 8s. This is putting it at the lowest price for cow's milk—4d. per quart; but goat's milk is really worth 6d. per quart. The value of the milk of three goats, the number required to maintain enough milk for a household all the year round—two being common goats, and the third a superior animal—would be £14 8s.; and the cost of their keep should not be more than £9.

In addition to the actual monetary value of the return in milk, something has to be said for the advantage from a health-giving and economic point of view. Where there is a family of young children, the blessing of a good home supply of milk is inestimable.

REARING KIDS.

When the milk supply of a goat is much required for household use, it is doubtful whether it pays to rear her kids. As regards the males, it certainly does not, and even the females only when the dam is an exceptional milker. If one considers the value of the milk consumed by one of their youngsters by the time it is weaned, it will be found to have cost something like 16s. The kids may be weaned in about six weeks. For the first three days, it is well to let the kids suck in order to have the benefit of the “biesting,” or first milk, which is especially adapted to the wants of

the newly-born, whilst unsuitable for domestic consumption. After this, it is better to milk the goat regularly and completely, and to feed the kids with it from a bottle, than to let the latter remain by the side of their dam, taking what milk they like until the time comes for weaning them. This system is practised on dairy farms with cows, and what applies with advantage to the larger animal is equally applicable to the smaller.

Previous articles on the "Milch Goat" appeared in the issues of this Journal for July and September, 1915, and January and June, 1916.

Mr. Mahoney, of the Queensland Department of Agriculture and Stock, who has kept milch goats for a long time, commenting on the foregoing, says that, of course, much of the matter contained in the article is not applicable to Queensland. Maize, he argues, is too heating. As to the cost of feeding, he puts it at 10s. per head per month in normal times. In this country bran, prime lucerne chaff, and crushed linseed meal form the main feed, a handful of oats being given at times. On the question of mating, he advises to wait for eighteen months. As to the yield of milk, his experience with a mongrel-bred goat has been that it gave $1\frac{1}{2}$ quarts a day after being in milk for 16 months. It all depends on the feeding. The fodders mentioned by the writer of the English article, he does not consider of any value, as bran and lucerne are not included by the former. The goat abovementioned returned a value of about £12 in milk in twelve months.

HOW TO TIN IRON UTENSILS.

Some time ago we received a letter from a subscriber asking how to tin iron utensils. We were unable to answer the question. In the "Town and Country Journal" of 21st November, 1917, we find the following instructions:—

"If the article is an old one, it must be put on the fire and allowed to get nearly red hot, which will get rid of all the grease. Then make a pickle of the following proportions:—Oil of vitriol, $\frac{1}{2}$ lb.; muriatic acid, $\frac{1}{4}$ lb.; water, 1 gallon. If the saucepan can be filled, so much the better; if not, keep the pickle flowing over it for, say, five minutes. Pour out, rinse with water, and scour well with sand or cork dust with a wisp of tow. Rinse well with water. If the pan is clean, it will be of a uniform grey colour, but if there are any red and black spots it must be pickled and scoured again till thoroughly cleaned. Have ready chloride of zinc, that is muriatic acid, in which some sheet zinc has been dissolved, some powdered sal ammoniac, some tow, about 18 inches of iron rod of about $\frac{1}{4}$ inch or $\frac{3}{8}$ inch thick (one end flattened out and bent up a little and filed clean), and some bar tin. Dip a wisp of tow in the chloride of zinc, then into the powdered sal ammoniac, taking up a good quantity and rub well all over, the inside; this must be done directly after the scouring, for if allowed to stand it will oxidise. Put on the fire till hot enough to melt the tin, the end of the bar being brushed over the heated part till melted. Run down about half the bar, and with the flat end of the iron rod rub the tin well over the surface, taking care not to heat too large a surface at once, nor to let it get too hot; which may be known by the tin getting discoloured, when some dry sal ammoniac must be thrown in. Having gone all over it, wipe lightly with a wisp of tow, made just warm enough that the tin does not stick to it. When cold, scour well with sand and tow, rinsing with plenty of water."

LUCERNE "DON'TS."

Professor Coburn in his "Book of Alfalfa," gives the following advice to lucerne-growers:—

"Don't sow any nurse crop. Don't sow in freshly-ploughed land, no matter how carefully prepared. Don't let weeds or grass grow over 6 inches high without mowing. Don't mow when the crop is wet with rain or dew. Don't let lucerne stand; if turning yellow, cut it. Don't sow old seed. Don't sow less than 20 lb. per acre, half each way. Don't pasture it. Don't let any water stand on it. Don't try to cut for hay until the lucerne takes the field. Don't let it go to a thin stand, but disc in more seed; don't be afraid you will kill it. Don't replough the land—disc it. Don't sow on land not well under-drained. Don't leave your land rough; use a roller to level and smooth it.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, NOVEMBER, 1917.

Broodies have been again exceedingly prevalent during the month of November. During the last week, 33 birds of the heavy breeds were placed in the broody coops. C. Knoblauch, A. H. Padman, and G. Williams have had 3 each out of their pens for broodiness in the light breed section. The weather has been very much against egg-production, the ground being saturated owing to the abnormal rainfall, which has been a great discomfort to the birds. Even with the adverse weather conditions, the health of the birds has been splendid. The total number of eggs laid during the month was 8,313. G. Chester and Kelvin Poultry Farm are equal for highest number of eggs laid in the light breeds with 141 eggs each; while R. Burns takes the first place in heavy breeds with 143 eggs. The following are the individual records:—

Competitors.	Breed.	Nov.	Total.
LIGHT BREEDS.			
E. Chester ...	White Leghorns	139	1,086
G. Chester ...	Do.	141	967
*G. H. Turner ...	Do.	120	958
F. W. Leney ...	Do.	128	942
*J. M. Manson ...	Do.	138	941
W. Becker...	Do.	121	936
Oakland Poultry Farm ...	Do.	136	925
W. R. Crust ...	Do.	127	933
Chas. Porter ...	Do.	97	909
Kelvin Poultry Farm ...	Do.	141	909
T. A. Pettigrove, Victoria	Do.	114	896
T. Taylor ...	Do.	123	884
Moritz Bros., S.A.	Do.	117	883
*J. Zahl ...	Do.	122	880
*A. T. Coomber ...	Do.	135	874
*J. R. Wilson ...	Do.	125	869
Quinn's Post Poultry Farm	Do.	109	854
D. Fulton ...	Do.	122	854
A. Shillig ...	Do.	117	852
*Mrs. J. R. D. Munro ...	Do.	119	835
J. G. Richter ...	Do.	94	825
A. H. Padman, ...	Do.	113	825
T. B. Hawkins ...	Do.	104	820
*Dixie Egg Plant ...	Do.	131	819
*T. Fanning ...	Do.	126	805
J. L. Newton ...	Do.	131	803
Mars Poultry Farm ...	Do.	108	800
*A. W. Bailey ...	Do.	105	791
Mrs. W. D. Bradburne, N.S.W.	Do.	121	777
R. Holmes ...	Do.	109	776
F. Clayton, N.S.W.	Do.	112	775
C. Knoblauch ...	Do.	69	768
G. Howard ...	Do.	107	760
J. Holmes ...	Do.	122	758
L. G. Innes ...	Do.	106	757
Mrs. S. J. Sear ...	Do.	121	754
E. Cross ...	Do.	115	749
G. J. White ...	Do.	114	747
S. C. Chapman ...	Brown Leghorns...	118	744
C. P. Buchanan ...	White Leghorns...	133	741
C. H. Singer ...	Do.	128	739
G. Williams ...	Do.	98	738

*Indicates that the birds are engaged in the single hen test.

EGG-LAYING COMPETITION—continued.

Competitors.	Breed.	Nov.	Total.
LIGHT BREEDS—continued.			
*A. E. Walters	Do.	118	734
J. Ferguson	Do.	122	722
E. A. Smith	Do.	112	713
Miss M. Hinze	Do.	112	703
*C. C. Dennis	Do.	102	699
Mrs. J. Carruthers	Do.	100	688
*Dr. E. C. Jennings	Do.	115	660
HEAVY BREEDS.			
*R. Burns	Black Orpingtons	143	1,027
*Mars Poultry Farm	Do.	129	945
W. Smith	Do.	153	941
A. E. Walters	Do.	103	917
W. S. Hanson, N.S.W.	Do.	106	861
*E. F. Dennis	Do.	106	857
F. A. Claussen	Rhode Island Reds	105	841
Mrs. J. H. Jobling, N.S.W.	Black Orpingtons	115	797
*E. A. Smith	Do.	139	785
D. Kenway, N.S.W.	Do.	103	773
Cowan Bros., N.S.W.	Do.	87	772
P. C. McDonnell, N.S.W.	Do.	98	769
H. Jobling, N.S.W.	Do.	114	768
*Miss M. Hinze	Do.	131	718
*Oakland Poultry Farm	Do.	96	717
King and Watson, N.S.W.	Do.	95	715
C. B. Bertelsmeier, S.A.	Do.	108	708
R. Burns	S. L. Wyandottes	107	684
E. Morris	Black Orpingtons	93	680
J. M. Manson	Do.	103	668
*Kelvin Poultry Farm	Plymouth Rocks	84	641
C. C. Dennis	White Wyandottes	98	641
F. Clayton, N.S.W.	Rhode Island Reds	57	575
*F. W. Leney	Do.	90	574
Totals	...	8,313	58,540

* Indicates that the birds are engaged in the single hen test.

DETAILS OF SINGLE HEN TESTS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
G. H. Turner	144	144	174	173	149	174	958
J. M. Manson	163	161	134	152	154	177	941
J. Zahl	169	110	174	100	179	148	880
A. T. Coomber	152	91	169	155	151	156	874
J. R. Wilson	161	143	141	158	121	143	869
Mrs. Munro	181	129	120	131	110	164	835
Dixie Egg Plant	133	159	155	160	154	58	810
T. Fanning	107	141	151	137	118	151	805
A. W. Bailey	36	137	158	158	153	149	791
A. E. Walters	104	107	119	144	131	129	734
C. C. Dennis	137	89	68	129	135	141	699
Dr. E. C. Jennings	78	81	123	125	151	102	660

EGG-LAYING COMPETITION—continued.
DETAILS OF SINGLE HEN TESTS—continued.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
HEAVY BREEDS.							
R. Burns	146	133	194	142	192	230	1,027
Mars Poultry Farm	146	178	149	161	162	149	945
E. F. Dennis	167	153	154	180	167	38	857
E. A. Smith	139	128	90	162	137	129	785
Miss M. Hinze	134	114	102	125	128	115	718
Oaklands Poultry Farm... ..	168	103	97	87	166	96	717
Kelvin Poultry Farm	96	100	103	155	74	113	641
F. W. Leney	98	106	73	88	113	96	574

Apiculture.

TO PREVENT BEES SWARMING.

From one of our South African exchanges, we take the following plan which corroborates the advice given by one of our Queensland successful apiarists:—

“ Before danger of swarming begins, take an empty hive-body, and into this put all comb (with adhering bees) from colony to be worked, with the exception of one comb, preferably one with least brood. This comb (with the queen) is left in the old hive, which is filled with frames with full foundation, and excluder placed over frames. Bees and comb in other hive-body are placed above excluder, after careful examination has been made to make sure that no queen-cells are present, and a frame with full foundation inserted in vacant space. Beginners may note that under the least sense of isolation, in a hive for the queen, queen-cells will be built, and in this case, with full excluder between, queen-cells will in all probability be built in this upper story. A week after manipulation, examination for queen-cells should be made, and if found must be destroyed.

“ And in this way does the bee need guidance more than in the matter of swarming. Our South African bees swarm at the least excuse, often apparently with no excuse; and just now, when the veldt, in many parts, shows a blaze of bloom, early swarming may be a trouble.

“ Bad as our South African bees are in the matter of swarming, the instinct can almost entirely be bred out by tactfully worked swarm prevention carried out season after season, and—a most important point—by breeding from colonies which have shown little inclination to swarm. This has been proved. The result is well worth the trouble entailed.”

PROSPECTS OF THE RICE INDUSTRY.

In the December issue of the Journal, in an article on Rice Culture, we mentioned Papua as a probable market for Queensland-grown rice. This prospect is confirmed by the following note and Government notices in the “ Papuan Courier ” of 5th October, 1917:—

Government Stores, Port Moresby,
18th September, 1917.

Tenders are invited and will be received at this office until noon on the 24th day of December, 1917, for the supply of 120 tons of “ Undermilled ” or “ Unpolished ” Siam rice.

2. The contract to cover a period of twelve months as from the first day of February, 1918.

4. A sample (weighing not less than 2 lb.) of the rice proposed to be supplied to accompany the tender.

Tenders are invited and will be received at this office until noon on the 24th day of December, 1917, for the supply of 240 tons No. 1 Siam Rice.

[It should be noted that rice is grown at one place only in the Territory—at the Catholic Mission on Yule Island—for local consumption.—Ed. “ Q.A.J. ”]

The Orchard.

OLIVE-GROWING.

It can hardly be said that the olive has been grown commercially in Australia (says a Sydney paper). The most considerable plantations that have come under notice are at the Wagga Experiment Farm and at Minchinbury Vineyards, Rooty Hill. In either instance the area all told probably does not amount to more than 2 or 3 acres. Still, the trees have been shown to bear freely of a good class of fruit under such widely differing conditions as in the typical strong red soil of the wheat districts at Wagga, chocolate volcanic soil at Minchinbury, and the poor sandy soil at Hawkesbury Agricultural College. One of the effects of the war is to prompt a regret that the olive has not been more extensively cultivated. One has to find out how prices have advanced to an unprecedented level. This is due to the cutting off of supplies from France, Italy, and Spain, upon which the market formerly was chiefly dependent. Before the year is out the shortage is likely to become more acute.

As far as the Commonwealth is concerned South Australia is practically the only producing State, and the product is favourably known on this side.

The area devoted to olives in South Australia only totals about 1,000 acres. This includes young and bearing trees, and the annual production of oil has averaged in the vicinity of 15,000 gallons. The manufacturers in the Central State have this year paid £13 per ton for olives, which is the highest price ever known in Australia. The cost of picking is also high, the rate this year being £6 per ton, or as much as was paid for the berries in the earlier days of the industry.

Professor Perkins, the South Australian Director of Agriculture, is a strong advocate of the extension of olive-growing. In his own State he considers the area of olive groves could, with perfect safety, be extended to 15,000 or 20,000 acres, especially in the light rainfall farming districts in which the soil is adequately provided with lime. He has, for instance, arranged to plant 520 acres on one of the Government farms in the form of shelter-belts and windbreaks, consisting of four rows of trees, 40 ft. apart, surrounding each paddock.

State measures, Professor Perkins is satisfied, are essential to the development of the olive oil industry, and suggests that the Government should undertake that in any new district in which olive-planting is done on an appreciable scale the fruit, when available, would be taken over at full market rates for crushing in State factories, if the facilities provided by private enterprise should prove to be inadequate. Further, in districts in which the plantations happened to be distant from State or private factories, he is of the opinion that special railway concessions should be given in respect to the carriage of ripe olives. He also suggests that the Government should offer to new planters a yearly bonus of 10s. or 20s. an acre planted, until the trees attain their tenth year. Professor Perkins emphasises the desirableness of systematic planting of olive groves under State control, and indicates that such a scheme, in conjunction with private enterprise, would carry in its train a number of advantages, including the provision of employment, in times of need, for those out of work, the reduction to a minimum, in the planted areas, of applications for drought relief; that it would afford employment on a large scale for returned soldiers; and, finally, assist materially to promote closer settlement.

The Queensland climate and soil are said to be better adaptable for the cultivation of this useful olive fruit than either South Australia or New South Wales, and it has been proved beyond doubt that the olive thrives exceptionally well, even to great perfection, in various places in Queensland. (Olive oil made at the Penal Establishment at St. Helena, Queensland, readily sold at 10s. per gallon wholesale.—Ed.) And why it has received so little attention in this State is somewhat hard to understand. But that is no reason why its cultivation should be neglected so lamentably in the future. It would be a good scheme for the Government to give the olive business serious consideration by selecting a suitable place for its growth and placing a batch of returned soldiers on a few acres of land for the purpose. A lot worse can be done by the Government than this; it would prove the commercial value of the olive and probably be the means of creating a new industry for this State.

A recent discussion in the columns of a Sydney daily paper on the cultivation of the olive has drawn some exceedingly interesting information from Mr. Leo Buring, manager of the Minchinbury Vineyards,



PLATE 4.—OLIVE TREES AT WESTBROOK.

Rooty Hill, where the olive has flourished for many years. Mr. Buring has had practical experience in all phases of olive-growing, olive-marketing, olive-pickling, and olive-drying. He is not greatly impressed with the prospect for olive-growing for oil extraction in New South Wales, owing to the labour difficulties; but, nevertheless, he is a confirmed believer in the food value of the olive. Accordingly, he contends that the olive should be planted by everybody who has room for a few trees, and he expresses the hope that what has been said in this column will stir up sufficient interest to induce the planting of this useful tree to a greater extent than has so far been the case in New South Wales.

It is, he says, essentially a tree that should be grown on small holdings, as under existing conditions it would never pay to plant out large areas, the cost of gathering except by child and woman labour being prohibitive. The introduction of legislation which prevents children

from remaining away from school during any part of the year to carry out such work as gathering of olives does away with any chance of picking this fruit economically. Such legislation, no doubt, was aimed chiefly at stopping truancy amongst city children, but it has prevented country children from earning money by doing work which would not only be healthy, but also be the means of creating an industry that would be of immense value to the country, and no doubt the increased consumption of the oil would also benefit the general health of the community. But that by the way. Taking one season with another, he says, and stripping the olives by hand on to bagging or tarpaulins spread under the tree, an average of 1 cwt. per picker per day is all that can be gathered. He has had children and women do this, but when men have been put on the cost of picking alone in normal times amounted to £10 a ton, or more than the fruit is worth. Once the cost of picking is more than £4 per ton, there is, Mr. Buring says, no profit in growing olives (just now the price of oil is abnormal owing to the war). It was for this reason that after planting out 5 acres at Minchinbury most of the trees were taken up and sold, and only an avenue of trees in bearing remains.

Mr. Buring holds the view that with the numerous poultry-yards throughout the State—and particularly in the county of Cumberland, every producer should plant these trees, as they give splendid shelter, and the ripe fruit as it falls is largely devoured by the fowls, and the oil and mineral acids the fruit contains act as a medicine for the poultry. There is, in his experience, no more useful tree for this purpose. Again, he advises every person who has a plot of ground planted with fruit trees for home use to find room for an olive. He recommends the Verdale in preference to any other. The Verdale will grow in all extremes of climate, equally well on the coast as inland, at sea level or elevations up to 4,000 and 5,000 ft.; it will resist a temperature of 20 degrees below freezing-point. Its only drawback is that it does not yield a high percentage of oil in comparison with the weight of fruit.

Many people are fond of pickled olives, says Mr. Buring, and many more would acquire the taste with the opportunity. The curing of olives, he points out, is very easily done, and no variety lends itself better to this purpose than the Verdale. To obtain the best value with olives they should be cured when they contain a fair percentage of oil. The Verdale grows to a nice size, and when nearly ripe its colour is light green. It is not so bitter as other varieties, so does not require in the curing so severe lye as other sorts. Further, it is freestone, and when cured ripe does not go mushy or mouldy like most other varieties. When bottled, it has a nice appearance, and its flavour surpasses the Spanish olive beyond description.

The olive is generally considered to take many years before coming into bearing. Mr. Buring points out that if its growth is stimulated by artificial manuring and watering, it will bear four years after planting out. The Verdale does not grow into such a large tree as other varieties, so in an orchard does not require more room than other fruit trees. Besides pickling, olives can also be dried, and, as the oil does not evaporate, the dried olive retains its full feeding value. The method is to allow the olive to become fully ripe, then cut off the twigs bearing the fruit and hang them under cover on string lines in an airy place. The olives gradually shrivel and take on the appearance of miniature prunes. The bitter flavour of the fresh fruit disappears entirely, and the dried olive has a delicious oily taste.

Viticulture.

HINTS TO GRAPEGROWERS.

By C. A. GATTINO.

TREATMENT OF THE VINE TILL FRUIT-BEARING.

(Continued from October, 1917.)

After having properly planted the vines as previously described, whether cuttings or rooted plants, shorten the top, leaving only one bud above the earth.

At the second year cut them back to one or two buds, according to the vigour of the growth.

At the third season prune them from two to four buds, so as to prepare the shoots to become fruit-bearing and make the main stem strong.

There are many methods of training the vines during the first two years (which may do to follow in gardens or against walls), but the system of foundation pruning mentioned above, was followed by myself and gave the most satisfactory results for vineyard culture.

Everybody knows that vines cannot produce fruit unless from wood two years old. There are often bunches growing from cuttings during the first year planting, but the buds from which they shoot were formed in the previous year.

It is, therefore, necessary to produce each year new wood to supply the place of the one which was previously fruit-bearing, so as to get bunches for the following year.

This is the fundamental principle of yearly pruning.

During these two years the ground will have to be kept well cultivated and free from weeds, taking care to replace each year in the fall (when the leaves have dropped), all dead and unhealthy plants with new-rooted plants of the same age.

To assist growers, who start with small capital, I recommend to plant other crops between the rows of the vines. This would not affect the growth of the vines, especially if the rows were planted for this purpose, as in accordance with my previous notes on planting.

I believe that the most suitable crop to plant is maize: this, besides giving a profitable return, allows the vines to prosper normally. This crop is appropriate in vineyards planted with wide rows, but for other systems of viticulture with narrow rows, there is no better cultivation than the potato.

This vegetable has a limited root development and does not injure the vines, on the contrary, the foliage of the vine and the foliage of the potato are subject to similar diseases, hence, if spraying becomes necessary, the one operation benefits both, and potatoes are always a highly profitable crop.

By using the proper manure, a double result will be obtained—that is, a good crop of potatoes and a strengthened and prolific grape-bearing vine.

When the potatoes are dug, I advise as a good practice the burying of the tops in the holes from where the potatoes were dug, thus returning to the soil moisture and humus.

P.S.—In my next notes I will give some hints about pruning.

Botany.

ILLUSTRATED NOTES ON THE WEEDS OF QUEENSLAND.

By C. T. WHITE, Government Botanist.

No. 12.

TWIGGY MULLEIN (*Verbascum Virgatum*, *With.*).

Description.—A tall stiff erect-growing glandular herbaceous plant of biennial duration. Stem simple or branched. Leaves oblong-lanceolate, toothed or crenate. The radical ones large and forming a rosette at the base of the stem, the upper ones alternate. Flowers yellow 1-1½ in. diam., solitary or in clusters of 2-5 in the axils of a bract and with two bracteoles at the base of each pedicel. Pedicels (flower-stalks) short. Stamens 5, filaments with long purplish hairs. Capsules globular. Seeds numerous, very small, rough, light brown or greyish in colour.

Distribution.—A native of the Mediterranean region and western Europe. Naturalised in the cooler parts of British India, the Pacific States of North America, and in Australia. In Queensland a common weed but not particularly aggressive; it is common on the Darling Downs, on the southern coastal areas, and in the Atherton tableland district in North Queensland. J. M. Black records it as a common naturalised alien in South Australia.

Notes on the Identity of the Species.—This plant has previously been recorded for Queensland under the name of *Verbascum Blattaria*, from which it differs in its very much shorter flowering and fruiting pedicels. *Celsia cretica*, a closely allied plant, has also been recorded as naturalised in Queensland. I have never, however, seen authentic material, all the specimens I have seen so labelled belonging to the plant now under notice. *Verbascum virgatum*, with its long racemes of large yellow flowers, is quite a handsome plant, and was no doubt introduced as a garden species.

SOAPSUDS AND SULPHUR FOR ROSES.

If people who have roses and love nice, clean foliage on the rose bushes would use a spray each wash day, applying the suds to the foliage, they need never be troubled with the rose pests.

In many localities there is a mildew on the rose foliage. Even this may be prevented by the use of the soapsuds with a little powdered sulphur added.

Try these remedies, and you will find them very valuable in preventing such troublesome pests in the rose garden.

APIARY NOTES.

Mr. Geo. Butler, hon. sec., Queensland Beekeepers' Association, in reply to several questions by an intending beekeeper, replies as follows:—

“The first essential, and one which is of the greatest importance, is to procure bees in standard hives. This will save you a lot of annoyance, and in case it becomes necessary to dispose of them at any time, you will not experience the same difficulty which would occur were the hives of different dimensions to those in general use. Do not purchase a great number at first. One or two is quite sufficient, and when you have become conversant with the habits of the bees, you may launch out with confidence. For your purpose I would advise you to use half supers. They are much easier to manipulate, and the bees are more readily driven out of the super. A few puffs of smoke will suffice to free the super of bees, which can then be taken away and the honey extracted. The cost of a colony of bees is about £2. It is advisable to purchase your colonies from an experienced beekeeper. He will give you good stock, and impart any information you may require.”

PLATE 5.—TWIGGY MULLEIN (*Verbascum virgatum*).

A Basal leaf with young axillary shoot. B Top portion of raceme. C Capsule.
D Seeds, natural size and enlarged.

Entomology.

CANE GRUB INVESTIGATION.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report on Cane Grub Investigation from the Entomologists at Gordonvale (Dr. J. F. Illingworth and Mr. E. Jarvis) :—

The heavy rains at the beginning of November have started the emergence of the grey-back cane beetles. Now is the time for everyone to be in harness, for it is only by co-operation that we shall have strength to successfully combat this terrible pest. The valuable information possessed by the growers, if collected and properly summarised, might enable us to complete our investigations several years earlier than if we were left to work out all the problems ourselves. Each one owes it to his own interest, as well as to the interest of the industry, to send in any information that he possesses along the line of the questions published on page 383 of the September "Sugar Journal." We are placing considerable faith in cultural methods, and desire all possible evidence. However, there must be no let-up to the collection of both beetles and grubs for the present, or, at least, until we discover a more economical method of control. I cannot urge this collecting too strongly, for there appears to be a lack of interest among growers now that a new Entomologist is appointed to handle the problem. Of course it is a well-understood fact that every female beetle destroyed within two weeks after emergence destroys all her progeny; and it is really an economical procedure if we can get them at this time.

As I have indicated before, we can place little dependence upon parasites for these native pests; and other control measures must be worked out. Though collecting the beetles and grubs is expensive, the expense is not prohibitive, and we know that by this method the pests are destroyed.

USE OF FIRES AND LIGHT-TRAPS.

Mr. Jarvis's experiments last season certainly showed that our common cane beetles are greatly attracted to lights, and this line of experiments is worth following up, for it is a subject that lends itself to extensive application. Numerous light-traps should be rigged up at the first appearance of the beetles. A trap can be made by simply suspending a lantern over a tub of water with a little kerosene on the surface. The trap should be sufficiently elevated to have the light visible from every direction. The flying beetles bump against the glass and fall into the kerosene-covered water, where they are quickly killed.

Recent experiments with small fires are encouraging; and undoubtedly vast numbers of the beetles, during their flight, succumb in the fires of the cane-fields. Anyway, we are continuing investigation of this important matter, and advocate small fires, started just at dark and kept up for about an hour, every evening during the flight of the beetles.

Where a large field of trash is to be burnt at this time, it would be well to conserve it by separating it into small blocks, and burn a little each evening. It may be profitable to save up rubbish of all kinds for fires at this time.

LEPIDIOTA FRENCHI AT MERINGA.

This grass-feeding species, recently described in detail by Mr. Jarvis, is becoming a serious pest of sugar-cane at Meringa. In one field of first ratoons, the grubs have gradually worked back from the grassy roadside, completely destroying patches of the cane by eating off all the roots. In digging up the dying stools, we found from six to ten large Stage III. grubs of this species. These same grubs, in their younger stages, did considerable damage to the plant-cane last year; and now, in their final stage, they are cleaning up some of the ratoons entirely. The owner of this field is treating the infested area, at our suggestion, with carbon bisulphide, in the hope of destroying these centres of infestation, which are evidently spreading to the surrounding healthy cane. The grubs, if left alone, would feed for several months yet, and emerge as beetles next year, since they have a two-year life cycle. Large grubs ploughed up at this season in grass-land are very apt to belong to this species; for all grubs of the common grey-back cockchafer changed to beetles, far below the reach of the plough, several months ago.

There is an excellent crop of cane on the half-acre plot treated with arsenic last season by Mr. Jarvis. Unfortunately, the experiment is not conclusive, because the owner treated the surrounding cane with carbon bisulphide without leaving the necessary check-plots. However, though the grubs were evidently not very bad in this locality last season, a few untreated rows left at the far end of the field became somewhat infested, so that a part of the cane fell over. Walking through the field, it is evident that the part treated with arsenic is just as vigorous as that treated with carbon bisulphide, and certainly the cost of the arsenic is considerably less.

Our 10-acre block at Meringa has all of the weedy-trash ploughed in, and a part of it is covered with a heavy growth of Mauritius bean. Since we were unable to get labour to put this land in shape for October planting, we are now planning to leave the part covered with bean and work the balance through the flight of the beetles, getting all of the 15 plots ready for March-planting.

Mr. Warner's co-operation with our department at Greenhills is going to be a mutual benefit. We shall have about a dozen plots, of an acre or more each, demonstrating principally cultural methods and the effects of poisons, fertilisers, &c.

MUSCARDINE FUNGUS.

Experiments started in August last with the green Muscardine fungus have shown that *Lepidiota frenchi* (Black) is victimised by this vegetable parasite.

Second-stage grubs of the above beetle were placed in cages containing infected soil of various degrees of moisture, with the result that those kept in very damp earth died in from 19 to 49 days, while

the percentage attacked by the fungus in drier soil was smaller and extended over a longer period. Judging by the results of another experiment with *frenchi* grubs, it seems probable that high soil temperatures do not favour the development of the fungus, since 75 per cent. of the grubs confined in cages kept at about 70 degrees Fahr. succumbed within a month, whereas those subjected to higher soil temperatures remained unaffected. We propose carrying out further experiments along these lines, in order to determine the action of this fungus on newly hatched first-stage grubs of our grey-back beetle. In this connection it may be mentioned that a bacterial disease of white grubs in America is engaging the attention of entomologists, and possibly if introduced into Queensland might prove beneficial. Grubs attacked by this organism, which is a species of *Micrococcus*, are characterised by a blackening of the affected parts.

Excessive wet apparently favours its development, so that our climate here, during the wet season, should afford suitable conditions for infection in the field, since at that time of year (January to March) grubs of *Albohirta* are doing the most damage.

The *Bacterium* in question is able to exist for over a year under artificial conditions, and has been successfully reproduced in healthy grubs by making an incision in the skin and placing them in infected soil.

Research work dealing with the economy of digger-wasps and other parasites is well in hand.

The life-cycle of *Campsomoris radula*, Fab., a scoliid wasp that preys on several kinds of cane beetles, is being successfully traced from eggs laid by this parasite at our Insectary.

Certain species of Dexiidæ, the maggots of which subsist on larvae of cockchafers, are also receiving attention, and it is hoped that further study in this direction may result in discoveries of economic value.

Our general collection of insects has been added to as opportunity offered. Several interesting species of Dexiidæ, Sarcophagidæ, and other Diptera, hitherto uncollected, have been obtained from scrub land.

As the hot weather advances, numerous fresh species of all kinds of insect life make their appearance, some of which are intimately associated with various pests of sugar-cane.

SCALE-FEEDING HABITS OF A PORTO RICAN MILLIPEDE.

RHINOCRICUS ARBOREUS, Saussure.

The journal of the Department of Agriculture of Porto Rico, U.S.A., July, 1917, contains an interesting note on the abovementioned millipede by R. T. Cotton, Assistant Entomologist, Insular Experiment Station. He says:—

“ While investigating the feeding-habits of some of the common millipedes of the island, to ascertain whether or not they were injurious to truck crops, I was surprised to find that one of the species had the very interesting habit of feeding on the purple scale of citrus—*Lepidosaphes beckii*.

“ This millipede is a large, dark reddish-brown form about 8 m.m. long (8-25 inch). It was identified by Dr. R. V. Chamberlin, of the Museum of Comparative Zoology, Cambridge, Massachusetts, as *Rhinocricus arboreus*, who stated that it is known in several other West Indian islands.

“ It was while walking through a citrus grove at Rio Piedras, P.R., that my attention was attracted by seeing several specimens of this millipede among the branches of a grape-fruit tree that was heavily infested with the purple scale. Pausing to watch them for a few minutes, I noticed that they were feeding voraciously on the scale, and smooth, clean patches on the scale-infested branches indicated where they had been at work. Transferring them to the laboratory, I placed them on grape-fruit twigs that were completely covered with scales, and in a very short time the twigs were cleaned off. Some idea of the voracity of this millipede may be gained from the fact that one specimen, by actual count, consumed two thousand scales in a period of three hours, and, after a short rest, continued feeding.”

Mr. Cotton decided to try and entirely clear an infested tree of the scale by them. He captured a number and placed about a dozen in each of several badly-infested grape-fruit trees. They at once began feeding on the scales, and at the end of two weeks the trees were perfectly clean, free from scales, and the bark took on a fresh green colour.

We submitted Mr. Cotton's note on the *Rhinocricus arboreus*, to Mr. H. Tryon, Government Entomologist in this State, and he has commented upon it as follows:—

“ It is usually held that all millipedes favour, or exclusively affect, a vegetable diet. This, indeed, is the opinion of F. G. Sinclair, the author of the animal division—‘ Myriapoda,’ for the Cambridge Natural History. Thus he writes (*Op. cit.*, p. 30):—‘ We have the Chilognatha or millipedes distinguished (from the Chilapoda or Centipedes) by their slow movements and vegetable diet.’

“ The habits of some of the arboreal members of the group occurring in Queensland are, however, scarcely consistent with this position.

“ This remark may or may not apply to our species of *Rhinocricus*, since in their case the feeding habits have not been made a matter of observation, either by myself or by anyone with whom I am acquainted; and Queensland, I may add, possesses several different kinds in its fauna—e.g., *R. brevipes*, Karsch; *R. crepidatus*, Karsch; and *R. opulentus*, Silvestri.

“ But Mr. Cotton's statements are, however, sufficiently interesting to justify one in inquiring, and by way of experiment, how far the habits of the Porto Rican *Rhinocricus arboreus*—the subject of his note—are shared by any of these or other of our representatives of its genus; and especially so, seeing that the scale insect (*Lepidosaphes bechii*), that he has found it will devour with such avidity, is, too, one of the more notorious of our plant pests.

“ He fails—it may be remarked—to distinguish, in anything that he has written, between habits evinced under special circumstances and

those generally displayed in feeding; and, obviously, it cannot be contended, with any regard to truth, that *R. arboreus* devours generally, much less commonly, the insect that he has found it to be so injuriously related to: much less, that it partakes of it exclusively. But, of course, this is a very important point in deciding the measure of its usefulness.

“Recently, I observed a native bird—the common leather head (*Philemon corniculatus*)—removing examples of a particular scale insect (*teroplastes cerifera*), one by one, from a tree that the latter had infested; and seeing it at work I had no doubt that were I to confine bird and tree in a common enclosure the former would soon completely rid the latter of its insect enemy. Now I do not propose to advance this observation as embracing the whole of the facts regarding the bird’s dietary. This applies to the Porto Rican Millipede in question. Wherefore, we must not read into Mr. Cotton’s statement of facts more than he intends us to imply.”

RICE BRAN.

In feeding horses with rice bran, substitute the same weight—not measure—as the corn superseded. A quart of corn weighs 1 lb. 14 oz.; a quart of rice bran 1 lb., so it does not do to feed by measure, unless the weight is taken into account.

In feeding cows, give one-fifth more of rice bran in place of wheat bran, add salt in order to induce the beasts to take it. Some beasts accustomed to certain foods will not readily take to others.

It will be interesting to those who are interested in food for stock to peruse the following analyses of common foodstuffs for stock as made by the Director of Agriculture in Mauritius, which we take from the West India Circular:—

—	Digestible Fibre or Cellulose.	Digestible Fats or Oils.	Digestible Proteins or Albuminoids.	Digestible Non- albuminoids Carbohy- drates.	Albuminoid Ratio.	Starch Equi- valent.
Rice Bran	6.2	6.1	7.8	33.5	6.9	72
Wheat Bran	6.8	2.6	10.0	35.0	4.7	71
Maize Seeds (Corn) ..	1.1	4.0	8.9	45.4	6.0	75
Oats (Grains)	7.2	4.3	9.3	40.7	6.2	79

HOME-MADE NIGHTLIGHT.

A glass of water, by a simple arrangement, can be turned into a useful candle-stick. Fill a tumbler three-quarters full of water. Take a piece of ordinary wax candle and stick a nail into its lower end in the same line with the body of the candle. The nail is for ballast; be careful in choosing it that it is of the right thickness and weight to cause the candle to float with only a quarter of an inch above the water. If properly balanced, the candle will burn steadily down to the bottom. The sides of the tumbler prevent air currents reaching the flame, and if the glass stands on a firm substance the water will not flow over the edge of the candle, for as the flame burns and the candle gets shorter it becomes at the same time lighter, and rises. The flame really burns more steadily than if the candle were in an ordinary candlestick, for not only are there no air currents to blow the flame about, but the water keeps the outside of the candle cool, so that the flame works out a kind of cup for itself in the wax. The next time you want a nightlight try this simple experiment.—“Farmers’ Union Advocate,” New Zealand.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR DECEMBER, 1917.

Article.										DECEMBER.	
										Prices.	
Bacon	...	...	...	...	...	...	...	lb.	9½d. to 10d.		
Barley	...	...	...	...	...	...	...	bush.	2s. 6d. to 3s.		
Bran	...	...	...	...	...	...	...	ton	£5 10s.		
Broom Millet	...	...	...	...	...	...	(no supplies)	„	£22 to £25		
Butter	...	...	...	...	...	...	...	cwt.	149s. 4d.		
Chaff, Mixed	...	...	...	...	...	...	...	ton	£2 10s. to £4 10s.		
Chaff, Oaten	...	...	...	...	...	...	...	„	£4 to £6		
Chaff, Lucerne	...	...	...	...	...	...	...	„	£2 15s. to £3 15s.		
Chaff, Wheaten	...	...	...	...	...	...	...	„	£2 10s. to £5		
Cheese	...	...	...	...	...	...	{ wholesale	lb.	9d.		
							{ retail	„	1s.		
Flour	...	...	...	...	...	...	...	ton	£12		
Hams	...	...	...	...	...	...	...	lb.	1s. 3d. to 1s. 6d.		
Hay, Oaten	...	...	...	...	...	...	...	ton	£7 10s.		
Hay, Lucerne	...	...	...	...	...	...	...	„	£2 to £2 6s. 8d.		
Honey	...	...	...	...	...	...	...	lb.	2½d. to 3d.		
Maize	...	...	...	...	...	...	...	bush.	4s. 4d.		
Oats	...	...	...	...	...	...	...	„	1s. 6d. to 2s. 6d.		
Onions	...	...	...	...	...	...	...	ton	£12 to £14		
Peanuts	...	...	...	...	...	...	...	lb.	4d. to 6d.		
Pollard	...	...	...	...	...	...	...	ton	£6 12s. 6d.		
Potatoes	...	...	...	...	...	...	...	„	£12 to £14 10s.		
Potatoes (Sweet)	...	...	...	...	...	...	...	cwt.	£2 10s. to £3 10s.		
Pumpkins (Cattle)	...	...	...	...	...	...	...	ton	£4 to £6		
Eggs	...	...	...	...	...	...	...	doz.	8½d. to 1s. 3d.		
Fowls	...	...	...	...	...	...	...	per pair	4s. to 7s. 8d.		
Ducks, English	...	...	...	...	...	...	...	„	3s. 10d.		
Ducks, Muscovy	...	...	...	...	...	...	...	„	7s. to 9s.		
Geese	...	...	...	...	...	...	...	„	11s. 6d. to 20s.		
Turkeys (Hens)	...	...	...	...	...	...	...	„	15s.		
Turkeys (Gobblers)	...	...	...	...	...	...	...	„	15s. to 28s.		
Wheat	...	...	...	...	...	...	...	bush.	4s. to 5s. 3d.		

VEGETABLES—TURBOT STREET MARKETS.

Asparagus, per dozen bundles	...	...	...	...	...	6s. to 12s.
Cabbages, per dozen	...	...	...	...	...	1s. to 3s.
Cauliflowers, per dozen	...	...	...	...	...	...
Chocos, per dozen	...	...	...	...	...	1s. 6d. to 2s.
Beans, per sugar bag	...	...	...	...	...	4d. to 1s. 9d.
Peas, per sugar bag	...	...	...	...	...	3s. to 5s. 6d.
Carrots, per dozen bunches	...	...	...	...	...	4d. to 9d.
Beetroot, per dozen bunches	...	...	...	...	...	6d. to 9d.
Lettuce, per dozen	...	...	...	...	...	1s. to 1s. 6d.
Parsnips, per dozen bundles	...	...	...	...	...	6d. to 1s.
Sweet Potatoes, per cwt.	...	...	...	...	...	2s. 6d. to 3s.
Table Pumpkins, per dozen	...	...	...	...	...	3s. to 6s.
Marrows, per dozen	...	...	...	...	...	1s.
Tomatoes, per case	...	...	...	...	...	2s. to 3s. 6d.
Cucumbers, per dozen	...	...	...	...	...	4d. to 9d.

SOUTHERN FRUIT MARKETS.

Article.						DECEMBER.
						Prices.
Bananas (Queensland), per crate ...	...	...	...	...	...	8s. to 11s.
Bananas (Tweed River), per crate ...	...	...	...	...	...	11s. to 13s.
Bananas (Fiji), per crate ...	...	...	...	...	...	...
Bananas (G.M.), per crate ...	...	...	...	...	...	...
Mangoes, per case ...	...	...	...	...	...	4s. to 5s.
Oranges (Navel), per case ...	...	...	...	...	...	10s. to 14s.
Oranges (Seville), per bushel case ...	...	...	...	...	...	...
Oranges (other), per case ...	...	...	...	...	...	6s. to 7s.
Papaw Apples, per half-bushel case ...	...	...	...	...	...	7s. to 10s.
Passion Fruit, per half case ...	...	...	...	...	...	8s. to 11s.
Pineapples (Queens), per double case ...	...	...	...	...	...	10s. to 12s.
Pineapples (Ripleys), per double case ...	...	...	...	...	...	7s. to 10s.
Pineapples (Common), per double case ...	...	...	...	...	...	7s. to 10s.
Tomatoes (Queensland), per half-bushel case ...	...	...	...	...	...	4s. to 5s.
Cucumbers, per bushel case ...	...	...	...	...	...	6s. to 8s.
Strawberries, per lb. ...	...	...	...	...	...	5d. to 6d.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.						DECEMBER
						Prices.
Apples, Eating, per bushel case ...	...	...	...	...	...	20s. to 28s.
Apples, Cooking, per bushel case ...	...	...	...	...	...	15s. to 16s.
Apricots, per case ...	...	...	...	...	...	7s. 6d. to 11s.
Bananas (Cavendish), per dozen ...	...	...	...	...	...	1d. to 4½d.
Bananas (Sugar), per dozen ...	...	...	...	...	...	1½d. to 3¾d.
Cape Gooseberries, per quarter-case ...	...	...	...	...	...	6s. to 9s.
Cherries, per case ...	...	...	...	...	...	4s. to 7s.
Citrons, per hundredweight ...	...	...	...	...	...	11s.
Cocoanuts, per sack ...	...	...	...	...	...	12s. to 15s.
Cumquats, per quarter-case ...	...	...	...	...	...	...
Lemons (Lisbon), per case ...	...	...	...	...	...	8s. 6d. to 15s.
Mandarins, per case ...	...	...	...	...	...	10s. to 15s.
Mangoes, per case ...	...	...	...	...	...	3s. to 6s.
Oranges (Navel), per case ...	...	...	...	...	...	17s. 6d.
Oranges (Seville), per hundredweight ...	...	...	...	...	...	3s. 6d. to 10s.
Oranges (other), per case ...	...	...	...	...	...	6s. to 12s.
Papaw Apples, per quarter-case ...	...	...	...	...	...	1s. to 3s.
Passion Fruit, per quarter-case ...	...	...	...	...	...	6s. to 10s. 6d.
Peaches, per quarter-case ...	...	...	...	...	...	1s. to 5s. 6d.
Pears, per quarter-case ...	...	...	...	...	...	12s. 6d. to 18s. 6d.
Peanuts, per lb. ...	...	...	...	...	...	4d. to 6d.
Pineapples (Ripleys), per dozen ...	...	...	...	...	...	2s. 6d. to 6s.
Pineapples (Rough), per dozen ...	...	...	...	...	...	2s. to 6s. 3d.
Pineapples (Smooth), per dozen ...	...	...	...	...	...	2s. to 5s. 6d.
Plums, per case ...	...	...	...	...	...	2s. to 5s.
Rockmelons, per dozen ...	...	...	...	...	...	7s. to 10s.
Strawberries, per dozen boxes ...	...	...	...	...	...	4s. to 10s.
Tomatoes, per case ...	...	...	...	...	...	2s. to 3s. 6d.
Watermelons, per dozen ...	...	...	...	...	...	6s. to 12s.

TOP PRICES, ENOGGERA YARDS, NOVEMBER, 1917.

Animal.							NOVEMBER.	
							Prices.	
Bullocks	...	...	...	...	...	...	£20 12s. 6d. to £25 2s. 6d.	
Bullocks (Single)	...	...	...	...	...	...	£29 5s.	
Cows	...	...	...	...	...	...	£13 5s. to £17	
Cows (Single)	...	...	...	...	...	...	...	
Merino Wethers	...	...	...	...	...	...	47s. 3d.	
Crossbred Wethers	...	...	...	...	...	...	39s. 9d.	
Merino Ewes	...	...	...	...	...	...	35s. 6d.	
Crossbred Ewes	...	...	...	...	...	...	39s. 9d.	
Lambs	...	...	...	...	...	...	41s. 6d.	
Pigs (Bacon)	...	...	...	...	...	...	...	
Pigs (Porkers)	...	...	...	...	...	...	69s.	
Pigs (Suckers)	...	...	...	...	...	...		

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF NOVEMBER 1917, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING NOVEMBER, 1917 AND 1916, FOR COMPARISON.

Divisions and Stations.		AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.		AVERAGE RAINFALL.		TOTAL RAINFALL.	
		Nov.	No. of Years' Re-cords.	Nov., 1917.	Nov., 1916.			Nov.	No. of Years' Re-cords.	Nov., 1917.	Nov., 1916.
North Coast.						South Coast—continued:					
		In.		In.	In.			In.		In.	In.
Atherton	...	1·90	15	6·33	5·21	Nambour	...	3·44	20	14·63	4·21
Cairns	...	4·22	34	7·24	2·13	Nanango	...	2·39	34	8·56	7·34
Cardwell	...	4·20	44	11·44	4·46	Rockhampton	...	2·08	29	5·61	3·33
Cooktown	...	2·97	40	3·77	1·06	Woodford	...	2·92	29	10·43	5·53
Herberton	...	2·45	29	3·87	2·39	Darling Downs.					
Ingham	...	3·84	24	10·80	5·25						
Innisfail	...	6·55	35	9·34	2·23	Dalby	...	2·47	46	5·63	7·59
Mossman	...	15·78	5	13·26	2·36	Emu Vale	...	2·38	20	4·62	4·85
Townsville	...	1·63	45	13·17	3·75	Jimbour	...	2·30	28	5·91	5·74
Central Coast.						Miles	...	2·27	31	9·94	7·28
Ayr	...	1·35	29	12·50	5·14	Stanthorpe	...	2·74	43	4·84	2·89
Bowen	...	1·25	45	6·34	1·58	Toowoomba	...	3·13	44	8·98	7·48
Charters Towers	...	1·51	34	4·70	2·89	Warwick	...	2·48	29	5·11	5·22
Mackay	...	2·90	45	6·57	3·93	Maranoa.					
Proserpine	...	3·13	13	8·09	2·42						
St. Lawrence	...	2·27	45	8·01	1·93	Roma	...	2·04	42	2·26	6·42
South Coast.						State Farms, &c.					
Biggenden	...	2·32	17	10·91	4·93	Bungeworgorai	...	2·16	4	...	6·84
Bundaberg	...	2·51	33	6·48	6·17	Gatton College	...	2·41	17	7·60	4·96
Brisbane	...	3·73	66	12·41	6·17	Gindie	...	1·79	17	7·11	4·90
Childers	...	2·55	21	7·96	6·66	Hermitage	...	2·16	10	5·25	5·60
Crohamhurst	...	4·25	23	12·31	6·38	Kairi	...	2·15	5	2·49	5·64
Esk	...	2·96	29	7·54	5·43	Kamerunga	...	3·02	26	7·87	2·55
Gayndah	...	2·75	45	7·18	5·76	Sugar Experiment Station, Mackay	...	2·44	19	5·97	...
Gympie	...	3·07	46	9·81	3·80	Warren	...	3·75	5	6·81	8·27
Glasshouse M'tains	...	3·44	8	12·96	2·28						
Kilkivan	...	2·51	37	4·97	3·44						
Maryborough	...	3·02	45	7·93	6·60						

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for November this year and for the same period of 1916, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Officer.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE.

1918.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		PHASES OF THE MOON.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	4.57	6.46	5.21	6.41	5.41	6.19	5.58	5.46	The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania.
2	4.58	6.46	5.22	6.41	5.41	6.18	5.59	5.45	
3	4.59	6.46	5.23	6.40	5.42	6.17	5.59	5.44	H. M.
4	4.59	6.46	5.24	6.40	5.43	6.16	6.0	5.43	
5	5.0	6.46	5.25	6.39	5.44	6.15	6.0	5.42	5 Jan.) Last Quarter 9 49 p.m.
6	5.1	6.47	5.25	6.39	5.45	6.14	6.1	5.41	13 „ ● New Moon 8 36 a.m.
7	5.2	6.47	5.26	6.38	5.45	6.13	6.1	5.39	20 „ ☾ First Quarter 12 38 „
8	5.3	6.47	5.27	6.37	5.46	6.12	6.2	5.38	27 „ ○ Full Moon 1 14 p.m.
9	5.3	6.47	5.28	6.36	5.46	6.11	6.2	5.37	The Moon will be at Perigee on 15th, Apogee on 3rd and 31st.
10	5.4	6.48	5.29	6.35	5.47	6.10	6.3	5.36	
11	5.5	6.48	5.29	6.35	5.47	6.9	6.3	5.35	4 Feb.) Last Quarter 5 52 p.m.
12	5.6	6.47	5.30	6.34	5.48	6.8	6.4	5.34	11 „ ● New Moon 8 5 „
13	5.6	6.47	5.31	6.33	5.48	6.7	6.4	5.33	18 „ ☾ First Quarter 10 57 a.m.
14	5.7	6.47	5.32	6.32	5.49	6.6	6.5	5.32	26 „ ○ Full Moon 7 35 p.m.
15	5.8	6.47	5.32	6.32	5.49	6.5	6.5	5.31	The Moon will be at Perigee on 12th, Apogee on 28th.
16	5.9	6.47	5.33	6.31	5.50	6.3	6.6	5.30	
17	5.9	6.47	5.34	6.30	5.50	6.2	6.6	5.29	6 Mar.) Last Quarter 10 44 a.m.
18	5.10	6.47	5.35	6.29	5.51	6.1	6.7	5.28	
19	5.11	6.47	5.35	6.28	5.51	6.0	6.7	5.27	13 „ ● New Moon 5 52 p.m.
20	5.12	6.46	5.36	6.28	5.52	5.59	6.8	5.26	19 „ ☾ First Quarter 11 30 „
21	5.13	6.46	5.37	6.27	5.52	5.58	6.8	5.25	28 „ ○ Full Moon 1 33 „
22	5.13	6.46	5.37	6.26	5.53	5.57	6.8	5.24	The Moon will be at Perigee on 13th, Apogee on 27th.
23	5.14	6.45	5.38	6.25	5.53	5.56	6.9	5.23	
24	5.15	6.45	5.38	6.24	5.54	5.55	6.9	5.23	4 April) Last Quarter 11 33 p.m.
25	5.16	6.45	5.39	6.23	5.54	5.54	6.10	5.22	
26	5.16	6.44	5.39	6.22	5.55	5.52	6.10	5.21	11 „ ● New Moon 2 34 „
27	5.17	6.44	5.40	6.21	5.55	5.51	6.11	5.20	18 „ ☾ First Quarter 2 8 „
28	5.18	6.43	5.40	6.20	5.56	5.50	6.11	5.19	26 „ ○ Full Moon 6 5 „
29	5.19	6.43	...	...	5.57	5.49	6.12	5.18	The Moon will be at Perigee on 10th, Apogee on 23rd.
30	5.19	6.42	...	...	5.57	5.48	6.12	5.18	
31	5.20	6.42	...	...	5.58	5.47	...	...	

For places west of Brisbane, but nearly on the same parallel of latitude— $27\frac{1}{2}$ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane.

At Roma the times of sunrise and sunset may be roughly arrived at by adding 17 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

For the sunrise and sunset at Rockhampton, Townsville, Cairns, and other places in Queensland, readers may be referred to the "Queenslander" to which newspaper monthly astronomical notes will be supplied.—D.E.

Farm and Garden Notes for February.

FIELD.—The land intended for potatoes should now be ready for planting. Plant sound small potatoes, well shot, without cutting them. If large potatoes are cut into setts, there is a risk of their rotting, as the usual wet weather may be expected, with a hot, muggy atmosphere. Weeds will be very troublesome, and for that reason the sowing of lucerne should be deferred till later. Sow lucerne in deep rich soil, thoroughly worked and deeply ploughed. Cape barley, panicum, kafir corn, imphee, sorghum, and vetches may be sown; but it is risky to plant maize for a late crop, as early frosts would destroy the ripening grain. For an early winter crop, sow swede turnips and mangel wurtzels. Pick cotton as the bolls burst. Do not pick until the dew has dried off the bolls. Expose the picked cotton for a couple of hours to sun heat.

KITCHEN GARDEN.—Make preparations for good crops of vegetables for the early winter by ploughing or digging all unoccupied land, supplying well-rotted manure if needed. Chicken guano is also an excellent fertiliser, if prepared as follows:—

Spread a layer of black soil on the ground. Dump the fowl manure on to this, and pound it fine with the back of a spade; add hardwood ashes, so that the compound shall contain—Soil, 3 bushels; fowl manure, 2 bushels; ashes, 1 bushel. Mix thoroughly, and a little before planting moisten the heap with water, or, better still, with urine; cover with old mats, and let it lie till needed.

Most market gardeners will have cabbages and cauliflowers ready for transplanting. Do this during the month. In the pamphlet on "Market Gardening" issued by the Department, it is recommended to sow the seed from the middle of January to the middle of March, arranging the time, however, to suit early and late districts. For winter crops, the Drumhead type, of which Flat Dutch and Queensland or Florida Headen are good examples, are the most profitable. The Savoy cabbage does well here. The best cauliflowers to grow are the Large Asiatic, Eclipse, Early Dwarf, and Le Normand. If the aphid appears, spray with tobacco solution.

Sow French beans, butter beans, beet, carrot, turnip, radish, cabbage, cauliflower, cress, peas. Should the weather prove dry after the January rains, give the plants a good soaking with water. Gather all fruit of cucumbers, melons, French and other beans, and tomatoes as they ripen, to ensure the continued production of the vines and plants.

FLOWER GARDEN.—Thin out and tie up dahlias. Keep the weeds down, and never allow them to seed. Sow hardy annuals. This is the best month for sowing, as you will be able to keep up a succession of bloom during the succeeding months of autumn and winter. To ensure this, sow phlox, pansy, daisy, stocks, aster, nasturtium, hollyhock, candytuft, mignonette, sweet peas, dianthus, carnations, cornflower, summer chrysanthemum, verbenas, petunias, pentstemons, &c. Dianthus, sown now and planted out in March, will bloom during the whole year, if the dead stalks and blooms are regularly cut away.

Do not sow flower seeds too deep, as on the depth will depend greatly what results you will have as regards the seed germinating. It is easy to remember that seeds should be covered with fine soil to a depth equal to their own size; for instance, a pea is about one-eighth of an inch in diameter, therefore, cover it with one-eighth of an inch of soil.

Orchard Notes for February.

In order that the series of monthly notes that have appeared for some years past in the "Agricultural Journal" might be rendered of more value to our fruit-growers, advantage was taken of the commencement of the new year to revise them and bring them up to date. At the same time, the notes have been somewhat altered, as, instead of making them of a general nature, applicable to the whole of the State, they are, to a certain extent, localised, as, although the general principles of cultivation, manuring, pruning, treatment of fruit pests, as well as of the handling and marketing of the fruit, are applicable to the State as a whole, there are many

matters that are of interest to individual parts of the State rather than to the whole State; and, further, notes that are applicable to the Southern part of the State for one month are not always applicable to the North for the same month.

In order to carry out this idea the State has been divided as follows:—

1. The Southern Coast Districts, south of the Tropic of Capricorn;
2. The Tropical Coast Districts;
3. The Southern and Central Tablelands.

This plan has met with such general approval during the past year that the notes will henceforth be published in accordance therewith.

THE SOUTHERN COAST DISTRICTS.

The earlier summer fruits, including grapes, will be pretty well over, but pineapples, mangoes, and bananas are in full fruit. The bulk of the main summer crop of pines ripens during the month, and growers are in consequence kept very busy sending them to both our local markets and canneries, and to the Southern States. The planting of all kinds of tropical fruits can be continued where necessary, though earlier planting of both pines and bananas is to be recommended. Still, if the land is thoroughly prepared—viz., well and deeply-worked—they can be planted with safety, and will become well established before winter. The month is usually a wet one, and both tree and weed growth is excessive. If unable to get on the land with horses to keep down weed growth, use the scythe freely in the orchard before weeds seed, as by doing so you will form a good mulch that will tend to prevent the soil washing, and that when ploughed in later on will add a considerable quantity of organic matter to the soil, thus tending to improve its mechanical condition, its power of absorbing and retaining moisture, as well as to increase its nitrogen contents.

This is the best month of the year in which to bud mangoes in the Brisbane district. The bark of the stock to be budded must run very freely, and the scion, when placed in position, must be tied very firmly. The bark of the scion should be slightly thicker than the bark of the stock, so that the material used to tie it keeps it firmly in its place. As soon as the bud is tied, ringbark the stock just above the bud, so as to force the sap of the stock into scion, so that a union will take place quickly.

Where cyaniding of citrus and other trees has not been concluded it may be continued during the month, as fruit treated now will probably keep clean and free from scale insects till gathered. If the trees have been treated with Bordeaux mixture, do not cyanide, as cyaniding should always be done previous to spraying with Bordeaux mixture.

If Maori is showing, spray with the sulphide of soda wash. Look out for Black Brand and also for the Yellow Peach Moth towards the end of the month in the earlier districts. Spraying with Bordeaux mixture is advisable in the case of both of these pests.

Get land ready for strawberry planting, so as to be ready to set out runners next month. Some growers set out plants as early as the end of February, but March is to be preferred. Citrus and deciduous trees can still be budded during the month. Young trees in nursery should be kept clean and attended to; ties should be cut where necessary, and the young trees trained to a straight single stem.

THE TROPICAL COAST DISTRICTS.

As the month is usually a very wet one in this part of the State, very little work can be done in the orchard other than keeping down excessive weed growth by means of a scythe. When citrus trees are making excessive growth and throwing out large numbers of water-shoots, the latter should be cut away, otherwise they are apt to rob the rest of the tree, and thus injure it considerably. Many of the citrus trees will come into a second blossoming during the month, and this will produce a crop of fruit ripening towards the end of winter and during the following spring. The main crop, where same has set in spring, will be ripening towards the end of the month, but as a rule insect life of all kinds is so prevalent at this time of year that the bulk of the fruit is destroyed. Where there is sound fruit, however, it will pay to look after. If the weather is wet it should be artificially dried before packing; but if there are periods of sunshine, then the fruit can be cut and laid out on boards or slabs in the sun, so that the extra moisture of the skin can be dried out. Care will have to be taken not to sun-scald the fruit, or to dry it too much; all that is required is to evaporate the surplus moisture from the skin, so that the fruit will not speck when packed.

Tropical fruits of all sorts can be planted during the month. Budding of mangoes and other fruits can be continued. Bananas must be kept netted, as fly is always bad at this time of year.

THE SOUTHERN AND CENTRAL TABLELANDS.

The marketing of later varieties of apples, pears, plums, peaches, and nectarines will occupy the attention of the Stanthorpe growers. The grape harvest will also extend right through the month. Every care should be taken to see that the fruit fly and codling moth are not allowed to spread, although the best work in fighting these pests has to be done during the months of December and January, as on the action then taken, if carried out systematically, the freedom of the later fruits from infestation mainly depends.

Handle the fruit carefully, and see that no fly or codling moth infested fruit leaves the district. The grapes, ripening as they do when this fruit is over in the earlier parts of the State, should be sent not only to Brisbane, but to all other parts of the State. For long shipment nothing can beat crates holding 6-lb. baskets. The fruit should be gathered some hours before packing, and be placed in the sun, so as to become thoroughly dry, and to allow the stems to become wilted, as this causes the fruit to hang on the bunch much better, and consequently to reach its destination in better order.

If parrots and flying foxes are troublesome, organised shooting parties or poisoning with strychnine are the best means of dealing with those pests.

The crop of grapes will be about over in the Roma and other inland districts. Citrus trees, when infested by Red Scale, should be cyanided. The orchard should be kept well cultivated after every rain, and when there is no rain, but water is available for irrigation, if the soil requires it, the trees should get a good soaking, which, if followed by thorough cultivation, will carry the trees on till the fruit is ripe.

TO PICKLE CHILLIES.

Take large green capsicums and slit them sufficiently to remove the seeds. Then make a brine of salt and water of sufficient density to float an egg. Place the chillies in this when the brine is cold, and let them remain there for twenty-four hours, then drain again, rinsing in cold water; then place in wide-mouthed stone or glass jars. Now take vinegar and water in the proportion of one quart of vinegar and one quart of water to every thirty chillies. Heat to boiling point and pour it over the peppers in the jars; leave it to stand till cold, then drain off this vinegar and water and throw it away. Heat fresh vinegar now without water, and pour it over the peppers boiling hot. Cover the jars tightly and set in a cool place.

We find many recipes which must commend themselves to dwellers in a hot country in the excellent "Journal of the Jamaica Agricultural Society." The chilli pickle is one; another is—

TO MAKE CHILLI SAUCE.

Take 1 dozen large tomatoes, 2 large onions, and 4 green chillies; peel the tomatoes and onions, and chop them up fine, also chop the green chillies fine. Keep them all separate till chopped, then mix and stir all together, adding two table spoonfuls of salt, two table spoons of sugar, one of cinnamon, and three tea cups of vinegar. Boil the whole steadily and slowly about an hour and a-half, stirring well all the time. Then bottle.

TO MAKE CHILLI VINEGAR.

Take, say 50 chillies to 1 pint of vinegar. Mash the chillies, then place them in a close jar or wide bottle, adding the vinegar, then cover tightly. At the end of four weeks uncover, strain, and bottle.

CREOLE PICKLES.

Ingredients.—3 or 4 cucumbers, 8 or 10 onions, 1 or 2 young spadices of cabbage palm, 1 or 2 green pawpaws, a few cut open peppers, a little whole allspice, Coleman's mustard, 2d.; curry powder, 2d.; turmeric, 1d.; black pepper and salt in proportion, and enough vinegar to cover the whole. *Mode.*—Cut up the cucumbers and onions, and soak in salt and water the day before, cut up the pawpaw and cabbage and boil each one in salt and water, but only until they break easily. Put the vinegar into a saucepan, and when it boils put in the cabbage and pawpaw and add, in a little while, the cucumber and onion, spices, and ground black pepper. Mix the mustard, curry, and turmeric with some cold vinegar, and add this to the boiling vinegar, and let all boil for a few minutes. Bottle and cork tightly when cold. N.B.—This quantity will make from 6 to 10 bottles.

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PART 2.

Agriculture.

SEASONABLE NOTES ON POTATO CULTURE.

During the present month and part of March potato planting will be universal in the southern portion of the State, and a few notes on the subject may prove helpful to many of our returned soldiers and others who are entering for the first time on a farming life.

CULTIVATION OF THE POTATO.

BY THE EDITOR.

Next to the cereals, the potato is probably the most important food plant grown for man. It is a native of America, and was brought to England between the years 1580 and 1585 by Sir Walter Raleigh, from Virginia. It was received, however, with great disfavour; and the Church condemned it as an unholy article of diet, seeing the race and place from which it originated. It was not until the year 1805 that, by the exertions of Dr. Buchan, it became popular. In France it was quite neglected until a certain gardener, who had grown some and found no sale for them, induced one of the kings of France to wear a potato blossom as a button-hole. This at once popularised the despised potato in that kingdom. Chemically, the potato consists of starch, gluten, and woody fibre, with, of course, water. On the authority of the late John Wilson, Professor of Agriculture, Edinburgh, an 8-ton crop of potatoes, taken from 1 acre of land, removes from the soil in which the tubers were grown—of the bases of alkaline earths, 90 lb. of potash, 8 lb. of soda, 5 lb. of lime, 7 lb. of magnesia; and of acids, 34 lb. of sulphuric acid, 20 lb. of phosphoric acid, 10 lb. of hydrochloric acid—in all, 170 lb. of inorganic matter. This was for tubers alone; and, if an equal quantity were allowed for the tops, the quantity taken from the soil would be about doubled.

MANURES.

It is, therefore, evident that, to grow potatoes to perfection, the foregoing constituent elements must be present in the soil. Professor Wilson found the best results to be obtained by preparing the soil early, and applying phosphatic and potash manures some time before planting, in the proportion of about 150 lb. to the acre. At the time of planting, nitrate of soda is sown in the drills at the rate of 1 cwt. per acre, and from $\frac{1}{2}$ to $\frac{3}{4}$ cwt. at earthing-up time.

On light, poor, sandy soils, nitrogenous manures in the form of sulphate of ammonia should be supplied at the rate of from 140 lb. to 170 lb. to the acre—one-half to be used at the time of planting, and the other half at the final earthing-up.

The matter of farmyard manures in growing potatoes is a somewhat vexed question. Undoubtedly farmyard manure is good, provided that it has been properly fermented and well decomposed; but there is nothing more fatal to good results with potatoes than putting fresh manure and potato setts together, for the young plant can never force its way through the fermenting mass of decay consequent upon slow decomposition.

Some interesting experiments, made in England by Mr. E. B. Hodley, Agricultural Superintendent to the Wilts County Council, threw considerable light on the matter of the use of artificial manures. The seasons were dry ones, and therefore more favourable to farmyard manure than to artificials, the yield from its use being considerably in excess of that obtained from the heaviest dressing (12½ cwt.) of mixed artificial manures. Where nitrogen, phosphoric acid, and potash have been applied in artificials, excellent crops have been obtained; but the heaviest crop of all was 14 tons per acre as the average of four years, grown where 8 tons of farmyard manure and 4 cwt. of sulphate of ammonia per acre were applied. The complete chemical manure was applied on different plots at the rate of 4 cwt., 8 cwt., and 12 cwt., respectively. Taking the averages for the four years, the 8-cwt. dressing proved the most economical, although the 12-cwt. dressing gave a somewhat heavier yield. When any one of the three constituents of the complete manure was omitted, there was a decrease of yield. Where the nitrate was omitted, the increase resulting from the application of kainit and superphosphate was not sufficient to pay for the cost; where superphosphate was omitted, the application of nitrate and kainit gave very little profit in excess of that obtained from the unmanured plots; and, although where kainit was omitted the yield most nearly approached that obtained from the completely manured plots, yet, even in this case, the profit was less than that obtained with a cheaper dressing of complete manure.

In conducting experiments of this nature, it should be remembered that artificial or farmyard manures will not invariably produce the same results on different soils. The rich, black soils of the Darling Downs, for instance, contain certain constituents which are wanting in lighter western or coast soils. In some there may be already a sufficiency of phosphoric acid; consequently, an application of superphosphate might prove injurious. Where cultivation grounds are deficient, as most of them are, in phosphoric acid, it becomes necessary, in order to obtain a better crop, to secure support in the form of an easily soluble phosphoric acid. Bonedust is a phosphoric acid manure which gives this result; but superphosphates produce better and quicker results.

For potatoes, a fertiliser rich in potash is essential. For general purposes a good mixed fertiliser for this crop should consist of—Available phosphoric acid, 7 per cent.; potash, 11 per cent.; nitrogen, 3 per cent; 700 lb. to the acre.

Sulphate of potash is mostly employed as a source of potash for potatoes. Muriate of potash is said to give even better results than the former.

Dried blood contains, on an average, 11 to 13 per cent. of nitrogen, but it is less soluble than sulphate of ammonia and nitrate of soda. Manures containing sulphate of ammonia should not be mixed with lime, nor applied to land which has been recently limed.

The value of kainit lies in its potash, of which it contains 12 per cent. It is the cheapest of the potash manures.

Following are the results of some experiments carried out by Mr. H. C. Quodling, Director of Agriculture, when manager of Westbrook State Farm. The manures used were—

- Superphosphate, at the rate of 4 cwt. per acre.
- Bonedust, at the rate of 4 cwt. per acre.
- Blood, at the rate of 4 cwt. per acre.
- Kainit, at the rate of 4 cwt. per acre.

One plot was unmanured, and planted with cut potatoes, and in the last plot, also unmanured, the potatoes were planted whole.

Manure.				Rate per Acre.	Weight of Seed Planted.	Cut or Uncut.		Yield per Plot.	Area of each Plot.
				cwt.	lb.			lb.	acre.
Superphosphate	..	..	..	4	178	Cut	..	716	¼
Bonedust	..	..	..	4	178	"	..	704	¼
Blood	..	..	..	4	178	"	..	712	¼
Kainit	..	..	..	4	178	"	..	722	¼
Unmanured	..	..	..	..	178	"	..	751	¼
Unmanured	..	..	..	..	178	Uncut	..	708	¼

The best manure then, for potatoes, is a mixture of farmyard manure and some artificial. For instance, 16 tons of stable manure per acre will produce a larger crop than the most remunerative dressing of artificial manure; but, employ a mixture of 8 tons of stable manure and 3 cwt. of nitrate of soda, or an equivalent quantity of sulphate of ammonia, and a far greater yield will be obtained—in fact, such a dressing gives the greatest yield and the most remunerative results of any. If stable manure is unavailable, any artificial dressing for potatoes should contain nitrogen, phosphorus, and potash. Omit one of these (as has already been shown), and the result will be a poor crop. The omission of nitrogen will cause the greatest loss, and that of potash the least.

SOILS.

Of all crops grown, the potato is the one which shows the greatest content of potash in the mineral constituents withdrawn from the soil. Hence the well-known value of soil derived from granitic detritus for potato culture. In it, we have abundance of potassium silicate, derived from the decomposing felspar and slowly set free in other forms, for the uses of the plant. Where ground has been annually cropped with potatoes for many years without a rotation, it is mainly owing to the potash having been used up that the soil is not liberal in its return of tubers.

Some of our scrub soils yield a fairly good crop of tubers, but rarely over 4 tons to the acre, and these are usually somewhat watery and bad keepers, while there is frequently an abnormal growth of tops. The best potato lands in this State are the black and red soils of the Darling Downs, notably at Allora, and, nearer the coast, at Forest Hill, Laidley, and Gatton, where an 8-ton crop is no rarity. Generally, it may be said that potatoes may be grown on any soil, but that those grown on clay soils are waxy and of bad quality; light, granitic soils produce nice, mealy potatoes; and fertile loams yield the best tubers—best both in quality and quantity.

SEED POTATOES.

When we speak of seed potatoes, we mean potato tubers which are planted, whole or cut, to produce a crop. Potato seed is a very different thing. The potato is a *Solanum*, which produces flowers and seed vessels. The latter appear in the form of a small green apple or tomato, which contains a quantity of small seeds, and it is by sowing many thousands of these seeds that new varieties are produced, in very limited numbers compared with the enormous numbers of seeds sown, by scientific growers, who make the production of new kinds of potatoes a business, and a very profitable business it has often proved to these experimenters. Here, however, I am dealing only with the tubers or so-called seed potatoes.

There is a good deal to be studied in the selection, care, and treatment of seed potatoes, and many farmers take far too little care of them. When the summer crop is dug, the small potatoes are hauled to the barn, and either left in bags till the next planting season comes round, or else in a large uncovered heap on the floor. Then, when planting time has arrived, it is considered time enough to overhaul the heap, bags, or pit, and pick out the rotten ones. Too often the seed is found in a matted condition, owing to the potatoes not having been turned. This necessitates the whole mass being stirred up—a process which breaks off the majority of the shoots. All this means loss—a loss which can easily be avoided by being careful to turn the seed over occasionally, say about once a fortnight, or, at any event, a fortnight before planting, by which a gain in growth may be brought about. New shoots will then form, and they will be up as early as those which were planted immediately after the last turning. An important point is to plant no potatoes except those which have sprouted. This was conclusively proved to be correct at the Queensland Agricultural College, when one plot was planted with sprouted, and another with unsprouted seed. The former came up uniformly with scarcely any misses, whilst the latter plot showed an irregular growth and wide vacant spaces. In trials which were carried out for the Irish Department, at sixty-seven centres in sixteen counties, there was an average increase of 2 tons per acre from sprouting, and in the four preceding seasons the increase due to sprouting ranged from 1 ton to 2 tons 13 cwt. No stronger testimony could be desired.

Now, concerning the size of seed tubers. Opinions differ as to whether small or large seed gives the best results. A trial was made in England to settle the question. Three rows of equal length and with an equal number of setts were planted with Northern Star potatoes as follows:—

Row No. 1: 38 setts, weighing 3 lb., produced 54 lb. of potatoes.

Row No. 2: 38 setts, weighing 4 lb., produced 64 lb. of potatoes.

Row No. 3: 38 setts, weighing 7 lb., produced 92 lb. of potatoes.

Assuming that the seed cost 1d. per lb. and the produce sold at 1d., we find that row 1 returned 4s. 3d.; row 2, 5s.; and row 3, 7s. 1d.—clearly a great gain in favour of the larger setts. All were planted on the same day, in equal ground, and all had the same amount of cultivation.

This leads to the subject of planting whole or cut tubers. Here again opinions differ. Some think it a waste to plant the setts whole, while others think the best results are got with uncut seed. Now, at the Guelph Farm, Michigan, U.S.A., experiments were made which lasted for four years, to decide the matter. These experiments are reliable, and emphatically show the advantage of planting good setts.

The experiments were made to test the effect of the number of eyes in the setts. The difference in the yield between those with one eye and those with five was found to be very considerable, amounting to about 28 bushels, the results being as follow:—

From 1 eye, 136.41 bushels per acre.
 From 2 eyes, 144.70 bushels per acre.
 From 3 eyes, 153.13 bushels per acre.
 From 4 eyes, 162.82 bushels per acre.
 From 5 eyes, 164.37 bushels per acre.

Up to four eyes in each sett, the increase in the field is, roughly, 9 bushels for each additional eye, so that, up to that extent, the increase in eyes would be well repaid in the field.

Against this experience, I place that of a Queensland potato-grower, Mr. James Pink, of Wellington Point. He says:—It has been the practice to select for propagation the refuse of the potato heap; small, ugly, ill-shaped tubers have been considered good enough for seed, and where the result has not come up to expectations, the cry is raised that the potato is degenerating. In carrying out this practice for years, was it possible to arrive at any other result? But the very art of gardening is to lift Nature above her normal state, by raising new and improved varieties of seed, and by selection.

The method of selection is peculiarly adapted to the principle of growing from single eyes. If we take an average good-shaped potato, weighing from 6 to 10 oz., we shall find that it has from 12 to 18 eyes, which, if cut into single eyes, would give as many setts, which would naturally produce a more even sample than the same number of whole tubers of different sizes. The principle of growing from single eyes has two great advantages—namely, economy of seed, and, upon suitable, well-tilled land, a larger crop of marketable potatoes.

When whole tubers are planted, two or three eyes start into growth first; these keep the lead during the entire growing season, and from their stolons the largest potatoes are produced. The weaker eyes start later into growth, and produce only small tubers of little value; but, when single eyes are planted, the whole strength of the sett is devoted to one growth; all the young tubers are formed nearly at the same time, and the plant, having no other calls on it for nutriment, these continue to grow and form large tubers. The whole tuber produces the largest number of potatoes, but the single eye will produce the most uniform sample and the heaviest crop per acre.

With a view to ascertain the relative productiveness of tubers and setts, a series of experiments was carried out in the gardens of the London Horticultural Society. A piece of ground was divided into 4-ft. squares, and in the centre of each square was planted either a whole tuber, or a single eye, or a sett containing three eyes on the whole surface of the tuber pared off so as to leave the eyes safe, but removing the centre—a practice not uncommon in Scotland. These were, in fact, potato peelings. If we consider the results of the whole sixteen experiments as being but one experiment, we shall find their proportions expressed by the following figures:—

Whole tuber	..	..	..	..	..	333.38, or 2	} nearly
Single eyes	..	..	..	..	..	717.87, or 11	
Three eyes	..	..	..	..	..	613.94, or 5	
Parings	..	..	..	..	..	504.69, or 4	

In adopting the principle of the single-eye culture, it is requisite that the eye should be taken from large or averaged sized potatoes, for the smaller the potato the weaker its producing powers. The crown eye always grows the strongest, and produces the largest potatoes. The eyes taken from the middle of the potato produce the best-shaped and most uniform tubers.

There are several ways of cutting the potato into single eyes. The principal thing to aim at is, to obtain a fair share of flesh of the tuber to each eye, with the least amount of cut surface. Take any potato and hold it before you with the stem end down. You will notice that the eyes are arranged around the tuber in regular ascending rotation from the bottom to the top, similar to the thread of a corkscrew. Now, take a sharp thin-bladed knife and remove the first eye by placing the knife equally distant between it and the eye next in rotation above it, sloping it to the indenture left by the stem, removing the flesh with it.

When the first eye is removed, turn the potato in your hand till the next eye appears; remove this in the same manner, and keep on turning the potato, removing each eye as it appears. These setts should be planted as soon as cut, and a little hot lime thrown over them will absorb the moisture, prevent premature decay, and also the attacks of insects. The above method could, however, scarcely be adopted by a farmer

who plants large areas of potatoes. As an experiment, it is, of course, very interesting and instructive, and useful as being a simple means of increasing valuable new varieties of potatoes.

Some farmers utterly condemn the time-honoured practice of cutting up the potato into setts. One man says:—In all the trials which have been recorded of the potato crops produced from cut and uncut seed, I have never met with an instance of the cut tubers yielding the most or best. This fact must surely be generally known, and it is most surprising that it is not acted on. The process of cutting may increase the setts by about 30 per cent., but, if the time taken in cutting them, and the decreased yield be taken into consideration, no advantage whatever is secured, but the reverse. A man is far better off with a piece of land planted with 25 or even 30 cwt. of whole tubers than if it were planted with 1 ton cut up to cover the same space. If cutting the potato is done to save seed, that is a very poor reason.

In dealing with the cutting of potatoes, the large tubers are mostly cut into three pieces, the medium ones into two, and the small ones are let go whole. Plant the best and largest cut sett side by side with a whole tuber; it will invariably be found that the whole tuber produces the greatest number of potatoes, and certainly the largest ones. The difference in favour of the whole sett I have frequently found to be 2 lb. to one plant, and imagine what this means in the case of thousands or tens of thousands of plants. The scarcer and more expensive a variety is, the more it is cut; and, consequently, the worse for the crop, and productive of certain degeneration. It appears to the writer, from his own practical experience, that, if potatoes are cut into setts with at least three eyes, the result is equally as good as when the whole tubers are planted, and that in the latter case there will be a larger proportion of small potatoes.

SPROUTING SEED POTATOES BEFORE PLANTING.

This is more often practised by cultivators of gardens than on the farm, but it has some decided advantages which all potato-growers may benefit by.

Seed potatoes are often badly prepared for planting, and still more often are not prepared at all. As a rule, they are kept in heaps in the barn or in bags till they are wanted in February or in August, or in a damp shed, where it is usually found that the growths have made considerable progress. The sprouts may be 2, 3, or 4 in. in length. They grow over and amongst the tubers like a network, and the greater part of them are broken off in moving the tubers, or before they can be separated. Many have little regret in doing this. They think it is necessary, and it is; but it is also exceedingly harmful, and this ought to be remembered, as deteriorated seed is always more or less unproductive. Fancy what the result would be were we to allow our corn to sprout unduly before sowing! The excuse is that potatoes will resprout, and they will; but never so robustly as in the first instance. These long growths take a great deal out of the tuber which ought to be kept in reserve to facilitate the ordinary growth in the soil, and superfluous growth should be wholly prevented. This is easily accomplished if given timely attention, and I would urge growers that they look to their seed tubers at once.

The first treatment should consist of preventing the growths from becoming long or of a pale colour, which occurs when they are kept in the dark. Begin keeping them in the right way by turning the tubers over and removing any diseased one meets with. Do not put them in a heap again, but lay them out in a single layer on the barn floor or some other building where they will be fully exposed to the light and receive a good deal of air. This will not only check the production of long, weakly shoots, but it will green and harden the tubers, and this is a great benefit to them, as a greened tuber is much more hardy to come in contact with the soil than one that has been kept from light and air for six months or more. The growths, which will be slowly produced when laid out in a single layer and in light and air, will be short and robust and altogether different and superior to the shoots drawn up in the heap.

THE LEAST EXPENSIVE WAY.

This laying out is one way of sprouting potatoes which should be followed by every farmer who attempts potato culture. It is the least expensive way of treating them, and will always pay handsomely, as the first growth and subsequent results from prepared tubers are infinitely better than when they are taken straight from the heap and planted, which very many are, unfortunately. But there is another way of sprouting which is still better. This is to get a number of wood trays from 2 in. to 3 in. deep, and of any width and length; from 3 ft. to 4 ft. long, and 2 ft. to 3 ft. wide, are handy sizes. A little fine soil is put in the bottom, and the tubers are stood up on end as close as they can be packed in the trays. The ends with the eyes or buds on them are kept up, and the trays are placed in light, airy sheds, or such like places. Forcing them into growth is not advisable, the object being to get hardy little shoots on the tubers, which will not be checked when they come in contact with the soil in planting. The growths should not be more than 1 in. long when planted, and $\frac{1}{2}$ -in. is quite as useful a length. If trays cannot be provided for all of them, there is no

reason why the whole should not be laid out in sheds, or the early sorts may be sprouted in trays first, planted, and the trays again filled with late kinds. The right time to put them in trays is before growth begins, and many of the early ones will require attention at once. Sometimes there are blind tubers. When these are planted there is a blank, but in sprouting none but growing tubers should be planted. If it is seen that the growths are likely to exceed 1 in. in length before they can be planted, check them by admitting more air, but in doing this take care that a cold cutting wind does not reach them, and always be sure that they are protected from frost if that is occurring, as it still may. When the tubers are planted quite dormant it is often a long time before growth shows above ground. It might often be earlier without much chance of being injured by frost. All, too, desire their crops as early as possible if grown to meet early markets, and there is no better way of helping them on than the process of sprouting before planting, and having both tuber and growths in a sturdy, hardy condition when put in the soil. I have found this bring the crops in a fortnight or three weeks sooner at digging time than dealing with unsprouted tubers or those sprouted in the heaps, and the yield is also better from sprouted than unsprouted sets. Do not run away with the idea that there is a good deal of fiddling labour about it, and is not worth the bother, but look on it as a very important aid to successful culture and extra remunerative returns, and you will not be disappointed.

There can be no doubt that seed potatoes are weakened by the rubbing off of the shoots when they have sprouted badly, but that a good crop may be obtained from a second sprouting has often been proved. Potatoes have even been planted when every vestige of a sprout was rubbed off and not an unsprouted eye appeared, yet they sent up vigorous shoots.

FLOWERING AND SEEDING.

Under favourable conditions the potato plant flowers freely, and produces a green berry which contains the true seed of the plant. It is from these seeds that the different new kinds of potatoes are produced. I need not here go into the matter of the production of seedling potatoes, as what is intended here is merely instruction to young farmers who have had little or no experience previously in the art of successful potato-growing. The work of raising new varieties is expensive and tedious, and is only undertaken by certain growers (as I shall presently show when I come to the cross-fertilising of potatoes), who practically devote their lives to the business, sowing hundreds of thousands of seeds, to find sometimes only one new plant worth cultivating.

The potato plant does not produce seed so freely in this State as in colder climates, and it is, perhaps, as well that it does not flower heavily, since experiments on

THE EFFECT OF FLOWERING OF POTATOES,

made by a German scientist, some years ago, to ascertain whether blossoming was detrimental to the development of potato tubers, showed that the effort of the plant to provide for its reproduction by means of seeds seemed to result in a corresponding weakness in its root growth and in the size and numbers of the tubers. The experiments were carried out on a number of plots on similar soil, every condition being exactly the same. On one plot the plants were allowed to bloom as much as they liked, but the blooms of the plants in the other plots were cut off at different times. The crop that had not been topped at all was the worst yield, and the best crop was the one that had been prevented from blooming by being topped at frequent intervals. Those that were topped at the latest stage of the plants' growth were not so satisfactory as in the case of the crop frequently topped off.

[TO BE CONTINUED.]

WHITE MUSTARD.

Two species of mustard are met with in cultivation—the *brown* or *black mustard*, with brown or dark-coloured seeds, and the *white mustard*, with yellow seeds. The former is cultivated solely for its seeds: these are ground, and the flour, after admixture with a proportion of the milder and less pungent flour of the white mustard, is used for making the well-known condiment. The latter is best known as a catch-crop for sheep feed or for ploughing in as green manure, and for the production of seedlings for salad. The crop, however, is also grown extensively in some districts for its seeds, which are used in the manufacture of mustard for domestic purposes.

Prices.—At the present time brown mustard is quoted on the London market at £7 16s. to £7 18s. per qr. (448 lb.), and white mustard at 10s. per qr. less. These prices, which are much above the average for the past few years, are attributable to a number of causes, including a lessened home production due to unfavourable weather during the early stages of the growth of the crop, the stoppage of imports from the

Baltic ports, and an increased demand from America. In normal times the market for home-grown mustard is strictly limited, and any considerable extension of the area under this crop would be attended with some risk, but so long as the present conditions continue there is likely to be a good market at home with the probable continuance of a demand from abroad.

Soil and Climate.—It would be well to confine the growing of brown mustard for seed to those areas that have proved best adapted for the purpose in the past, viz., the good fenlands and marshlands of Lincolnshire, Cambridgeshire, Huntingdonshire, and Norfolk, as this crop requires a deep, moist, well-drained fertile soil, free from acidity. There is one serious drawback to the cultivation of brown mustard. The seed, especially if the crop is over-ripe, is apt to shell out at harvest and cause trouble in subsequent crops.

White mustard is adapted to a much wider range of conditions than brown mustard, both as regards soils and weather, and causes less trouble from shed seed. It can be grown more or less successfully on all kinds of land, and is a safe crop to take on freshly-ploughed grass-land, as wireworms attack it only slightly or not at all. On heavy claylands it is often taken after dead fallows, the following crop being wheat. This system invariably proves a great success, both as regards the mustard and the wheat. On heath and light lands, white mustard is taken before barley. It is said that where turnips will grow white mustard will succeed.

FOR SEED PRODUCTION.

Generally speaking white mustard may be regarded as a fallow crop, permitting the usual summer cultivations. At the present time, when every available acre should be under a useful crop of some kind, white mustard might in many cases be grown on land normally bare-fallowed.

Seed Bed.—The ground requires thorough preparation, and a fine and fairly solid seed bed is essential.

Manuring.—If the land is in good heart the only manure needed is 3 to 4 cwt. of superphosphate per acre. In other circumstances a good dressing of farmyard manure, say 10 to 15 tons per acre, should be given, in addition to the superphosphate.

Seeding.—White mustard may be drilled at any time from the first week in April to the middle of May. If it is sown earlier it runs the risk of being cut off by frost, but if the earlier sown crop is successful it has the advantage of coming to harvest before the corn harvest begins. The seed should not be buried more than half an inch, or it will not germinate evenly; it is usually drilled on the flat in rows 12 to 18 in. apart. Some growers drill 12 in. apart and chop out the plants 9 in. in the rows or, to save labour, run the horse-hoe across the crop; on good land the plants require more room to enable them to branch. If the seed-bed is sufficiently fine, half a peck of seed, or slightly less, will be ample for 1 acre.

Harvesting.—Great care should be exercised in judging the correct time to cut: if cutting takes place too early the seed will be green and shrivelled, while if it gets too ripe there is great loss through seed shelling on the land, especially in windy weather. Old growers say they wait until the colour of the pods assumes the brownish tint of a hare's back. It is advisable to cut the crop slightly on the green side and give it plenty of "field room" to enable the plant to dry out thoroughly. White mustard is generally cut by hand with sickles, and laid on the ground in small bunches; but when there is a scarcity of labour or the men are not used to this form of cutting, the ordinary corn binder does the work well. Small sheaves should be made and not tied too tightly, and the crop should be cut as high as possible so that the high stubble may form a good resting place for the sheaves. The sheaves should be turned after two or three days, and carted when thoroughly dry. In carting care must be taken to prevent loss of seed; cloths should be put over the racks or frames fixed to the carts to catch any shed seed, and this should be distributed over the stack from time to time and not laid in heaps, or the seed will turn mouldy.

Stacking.—A good staddle is necessary. This may consist of faggots or brush-wood covered with straw or coarse grass, on the top of which should be placed a cloth or old bags to catch any shelled seed. The stacks should be relatively small, about 4 yards wide, to prevent over-heating. In some districts, stacking is obviated by threshing the crop in the field.

Threshing.—This is done with the usual tackle, the only extra parts required being four sieves of smaller size than those in normal use; such sieves can usually be supplied by the makers of the threshing machines.

Yield.—The yield varies very greatly. It may be as much as 40 bushels, but normally runs about 16 to 20 bushels, or a little more, per acre.

The chaff (pods) is used for feeding, but the straw is practically of no value for fodder, but may be used for the bottoms of stacks and cattle yards, and in some parts to form shelter walls around open cattle sheds.

FOR CATCH CROPPING.

As a catch crop for forage, mustard has many points in its favour. It grows very quickly and yields a large amount—from 10 to 14 tons per acre—of nutritious green food suitable for sheep feeding. Under favourable conditions it will often reach a height of 3 ft. or more and be ready for folding in six to eight weeks from the time of sowing. Thus it enables land to be occupied profitably even when only a short interval occurs between two ordinary rotational crops, *c.g.*, after vetches, peas, or early potatoes, and in cases where the turnip crop has failed.

When sown in *May, June, or July, from $\frac{1}{2}$ peck to 1 peck of seed should be drilled in rows 12 to 18 in. apart. Drilling gives an opportunity for keeping down weeds and for stirring the land. Later in the season when weeds have not the same chance of coming to maturity, *c.g.*, after a corn crop, the seed may be sown broadcast on a lightly ploughed furrow and harrowed in; from 18 to 20 lb. of seed per acre should be sown under these conditions.

The crop should be fed off before flowering, while it is still succulent, as the plants become fibrous and hard as maturity is reached. In feeding off, it is desirable to give some other food of a drier nature at the same time, or to run the sheep on stubbles or old pasture before turning them on to a fresh "break."

FOR GREEN MANURE.

Mustard is often grown for ploughing in as green manure. This practice is specially to be commended for soils in poor condition when the supply of farmyard manure is inadequate. A ribbed roller, run over the crop prior to ploughing, facilitates covering and, by bruising the plant, helps to promote decomposition. In addition to increasing the store of organic matter and thereby improving the water-holding capacity of light soils, a mustard crop when ploughed in helps to keep strong soils open, promotes aeration and drainage, and thus improves their texture.

After ploughing in mustard on the lighter soils it is desirable to consolidate the ground by rolling.—Board of Agriculture and Fisheries, Whitehall Place, London, S.W.

THE COTTON OUTLOOK FOR 1918.

Up to the end of last year, the American and Liverpool cotton markets continued firm, and the trend of values was upward. Advices from America concerning the crop were not satisfactory, for killing frosts had been experienced in Texas, damaging the late cotton, and rains in the Eastern and Central divisions had delayed picking and the movement of the crop. Few farmers, except in Texas, were holding for higher prices. In the latter section they were holding for 30 to 40 cents (1s. 3d. to 1s. 8d.) per lb.

Whether rightly or wrongly, there is a growing belief in the American cotton districts that the most serious problem for the world will be the question of food supplies, and so pronounced will this become that even with the end of the war for one or two years small cotton crops from America will continue the rule. For delivery in January, 1918, prices closed at 21.13d. against 20.03d. a week earlier. British spinners continue to complain of the high prices they are compelled to pay for spot cotton, and assert that they have to pay, practically, any price demanded, and that conditions in the cotton trade are not much worse, is attributable to the successful work of our navy. The "Memphis Commercial Appeal" estimates the frost damage at 1,171,000 bales, and that in a single month the crop had deteriorated 5.9 per cent., and cotton was being marketed as fast as gathered and ginned.

It is significant that the American yield per acre last season was 156.6 lb.; in 1915-16, 170.3 lb.; and in 1914-15, 209.2 lb.

The average estimates indicate a total crop of 11,500,000 to 12,000,000 bales, and some planters are holding for 50 cents (2s. 1d.) per lb.

Seeing that after the war there will be a serious falling off in the cotton crops of America, owing, as stated, to the imperious demand for foodstuffs, and furthermore, considering that oversea transport will be resumed, there is every prospect that the golden era of the years from 1866 to 1873, when cotton-growing promised to become a permanent and paying industry in Queensland, will return, and that possibly cotton-growing will become as important an industry in this State as in the United States of America. The Queensland grower has happily not to contend with any terrible

* August, September, or October in Queensland.

destructive pest, like the boll weevil and cotton stainer, so ruinous to the American grower. Neither has he to fear destructive early frosts, even in the South. His returns are also much larger per acre. As above shown, the highest yield of ginned cotton per acre in America was a little over 209 lb. in 1914-15, while the average for three years was about 178 lb. If our growers, by good cultivation, can raise, as they have done, from 1,000 lb. to 2,000 lb. of seed cotton per acre, this, at 300 lb. of clean lint per 1,000 lb., would yield from 300 to 600 lb., or an average of 450 lb. lint as against the American average of 178 lb. Is it not worth while to once more enter in earnest on cotton-growing, and to do so in the coming season, so as to take full advantage of the inevitable high prices to come, as indicated above? The Department of Agriculture has been, and always will be, in sympathy with the cotton-growers, affording them every facility by supplying reliable seed, making advances on the crop, and taking the whole business of ginning and marketing, returning all profits to the growers. The department also distributes a pamphlet dealing exhaustively with all phases of the industry, and which is constantly kept up to date.

MARKET GARDENING.

POSSIBILITIES IN MINT.

A few years ago there was a certain amount of activity shown on the question of mint-growing being a good investment. This was taken up by a few, but, on the whole, the interest did not live for very long. Now is the time to revive it, for it provides an opportunity of attacking Germany, as before the war a great deal of the mint sold with packets of dried peas came from that country. Why not let Australia step in here? The work is simple enough. Mint grows easily in a favourable soil and multiplies rapidly. In picking it, care must be taken not to bruise the leaves, for mint bruises easily. This will not show clearly till the leaves are dried; then they turn black, and naturally must be thrown on one side as useless. To dry it, hang the mint up in sprigs from a ceiling where there is a good draught and no moisture. The simplicity of the whole operation should appeal to anyone who does not care for hard work, and yet wishes to eke out a few extra pennies.—“Town and Country.”

BEEES AND GRAPES.

Referring to a rumour that an ordinance prohibiting the keeping of bees within the city of Jerseyville, Illinois, U.S.A., was to be passed by the City Council, a correspondent of the “American Bee Journal,” in denouncing the proposal, which, by the way, arose from a statement that bees were ruining the grape crops, made the following statements:—

1. Bees cannot sting grapes. If they did, it would poison the grapes, and they would be killed by their own devices.
2. Bees cannot puncture grapes in any way. You can test this to your own satisfaction by placing a bunch of sound grapes within a hive of bees. You will find that the grapes have been untouched. If you puncture or crush one of the berries the bees will consume the juices.
3. The damage done to grapes is done by birds at daylight, before sunrise. The bees come afterwards, and gather what would otherwise be lost, for grapes that have been picked by birds will not keep.
4. Even if bees could puncture grapes, and did so, an ordinance forbidding the keeping of them within city limits would be of no avail, for bees can fly for a mile or more, and usually fly half a mile, in search of food.

No ordinance was passed.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The following revised list of breeders of purebred cattle is published for the purpose of informing those who desire to improve their stock where the best cattle can be obtained in the State. The Department of Agriculture and Stock takes no responsibility in relation to the entries in the list; but, when inquiries were first made, the condition was imposed that the entries were to be only of stock that had been duly registered, or that were eligible for registration in the different herd books. The entries received were, in some cases, somewhat too confusing for proper discrimination, it has, therefore, now been decided that only such cattle as have been registered will be included. The lists previously published in the *Queensland Agricultural Journal* have now been withdrawn for revision.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
F. C. G. Gratton ..	"Towlestone," Kings-thorpe	2	14	Holstein Cattle Club Herd Book
T. Mullen	"Norwood," Chelmer	3	20	Queensland Jersey Herd Book
J. H. Paten	Yandina	6	21	Ayrshire Herd Book of Queensland
Queensland Agricultural College	Gatton	4	38	Ayrshire Herd Book of Queensland
		..	2	Ayrshire Herd Book of Scotland
		2	9	Holstein-Friesian Herd Book of Australia
		2	31	Jersey Herd Book of Queensland
				Ayrshire Herd Book of Queensland
J. W. Paten	Wanora, Ipswich ..	10	42	Queensland Jersey Herd Book
M. W. Doyle	Moggill	4	12	Herd Book of the Jersey Cattle Society of Queensland
G. A. Buss	Bundaberg	1	15	Milking Shorthorn Herd Book of Queensland
W. Rudd	Christmas Creek, Beaudesert	2	10	Herd Book of the Jersey Cattle Society of Queensland
M. F. and R. C. Ramsay	Talgai, Clifton ..	5	27	Holstein-Friesian Herd Book of Australia
George Newman ..	Wyreema	9	37	Queensland Jersey Herd Book
R. Conochie	Brooklands, Tingoor	9	21	

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
W. J. Barnes	Cedar Grove	10	37	Queensland Jersey Herd Book
T. B. Murray-Prior ..	Maroon, Boonah	2	37	Queensland Shorthorn and Australian Herd Books
W. J. Affleck	Grasmere, N. Pine	6	31	Queensland Jersey Herd Book
A. J. McConnel	Dugandan, Boonah ..	19	36	Australian Hereford Herd Book
A. Pickels	Blackland's Stud Farm, Wondai	4	62	Illawarra Dairy Cattle Herd Book of Queensland
G. C. Clark	East Talgai, Ellinthorp	3	7	New Zealand Herd Book
H. D. B. Cox	Sydney (entered brother's name) ..	3	16	Commonwealth Standard Jersey Herd Book
J. T. Perrett and Son	Coolabunia	2	36	Illawarra Herd Book of Queensland
State Farm	Kairi	4	8	Ayrshire Herd Book of Queensland
		1	2	Holstein-Friesian Herd Book of Australia
		45	127	Australian Hereford Herd Book
E. M. Lumley Hill ..	Bellevue House, Bellevue	2	22	Illawarra Herd Book of Queensland
W. T. Savage	Ramsay	50	400	Australian Hereford Herd Book
Tindal and Son	Gunyan, Inglewood ..	3	28	Queensland Jersey Herd Book
J. N. Waugh and Son	Prairie Lawn, Nobby ..	9	55	Ayrshire Herd Book of Queensland
J. H. Fairfax	Marinya, Cambooya (2)	25	100	Queensland Shorthorn Herd Book
C. E. McDougall	Lyndhurst Stud, Warwick (2)	6	20	Ayrshire Herd Book of Queensland
J. Holmes	"Longlands," Pittsworth	1	20	Illawarra Dairy Cattle Association
P. Biddles	Home Park, Netherby ..	1	9	Milking Shorthorn Herd Book
A. Rodgers	Torran's Vale, Lane-field	1	..	Holstein-Friesian Herd Book of Queensland
R. S. Alexander	Glenlomond Farm, Coolumboola	2	..	Holstein-Friesian Herd Book of Australia
		3	83	Ayrshire Herd Book of Queensland
State Farm	Warren	2	15	Holstein Cattle Club Herd Book
S. H. Hosking	Toogooloowah	1	2	Queensland Jersey Herd Book
W. J. H. Austin	Hadleigh Jersey Herd, Boonah	..	6	Commonwealth Standard Herd Book
Ditto	ditto	7	21	Ayrshire Herd Book of Queensland
H. M. Hart	Glen Heath Stud, Yalangur	3	9	Holstein-Friesian Herd Book of Queensland
C. Behrendorff	Inavale Stud Farm, Boonah	25	77	Ayrshire Herd Book of Queensland
F. A. Stimpson	Ayrshire Stud Farm, Fairfield, South Brisbane	5	21	Ayrshire Herd Book of Australia
M. L. Cochrane	Paringa Farm, near Cairns			

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
Albert Cook	"Greenmount," Mackay	1	8	A.-A. Stud Book, New Zealand
Thomas Brown	"Bellgrove," Kingaroy	1	14	Do.
Higgins Bros.	Sandy Creek, Leslie, Q.	6	2	Do.
Calcino Bros.	"Summariva," Charleville	3	4	Do.
W. M. McKelvie	"Undulla," Miles ..	5	4	Do.
James Connors	"Glen Erin," Nanango	1	2	Do.
J. A. Mackintosh	"Yundah," Warwick	2	8	Do.
M. J. Luff	Kaimkillenbun	1	1	Do.
A. Spencer	Brisbane	2	1	Do.
Beak Pastoral Co.	Rockhampton	2	10	Do.
E. Swayne, M.L.A.	West Plane Creek ..	1	2	Holstein-Friesian Herd Book of Queensland
Godfrey Morgan	"Arubial," Condamine	3	6	Queensland Shorthorn Herd Book

A NATURAL REMEDY FOR WORMS AND BLOOD DISEASES IN STOCK.

BY L. G. JONES (late 2nd Lieut., 41st Battalion, A.I.F.).

The attention of stockbreeders, pastoralists, and farmers is directed to the following article under the above heading:—

Sheep eating earth at certain spots was one of the first things I noticed when I came over from Tasmania to the main land (Burrowa district, New South Wales), and everybody I spoke to in the district replied: "Oh, that is where there is a salty soakage, or where at some period or other salt has been thrown on the ground for the stock to lick, as was the custom on some stations in olden days, and has been washed into the ground by rains." Not being satisfied, I gave the subject more consideration, and further studied the positions of the lickholes (by which term they were generally known to sheep men), which brought me to the conclusion that, if they contained salt in sufficient quantity to cause sheep to lick at them, it must be a natural soakage and was not through salt being tipped there in days gone by, as the positions and localities in many instances flatly contradicted it. The next peculiarity I noticed was that these lickholes ran reef-like across country, as would a lode of silver or other mineral, and would be cut, perhaps, by a creek or come to the surface on a flat when the sheep would lick or burrow for the earth as the case might be, and in no case could I detect any saline taste in the earth. I felt convinced that the salt idea was a hypothesis and not a fact. At this stage I decided to have an analysis made, and which is now herewith attached:—

ANALYSIS OF LICKHOLE.

	Per cent.
Moisture	3.85
*A volatile and organic	4.20
Insoluble silica	80.20
Soluble silica SiO_2	.28
Ferric oxide Fe_2O_3	7.10
Ferrous oxide FeO	trace
Alumina Al_2O_3	3.11
Lime CaO	.63
Magnesia MgO	.49
Potash K_2O	.11
Phosphoric acid P_2O_5	.37
Sulphates So_3	.17
Chlorine, equivalent to sodium chloride	.87
	101.38

*Containing: Nitrogen = .08 per cent., equivalent to ammonia = .09 per cent; alkalinity or sodium carbonate = .21 per cent.

Whilst waiting for the analysis of the lickhole I put salt into their troughs and allowed the sheep free access to it, and I observed that they partook of the salt, but it did not lessen their visits to the lickhole. This, to me, was conclusive proof that the sheep did not go to the lickholes because they wanted salt. And this conclusion was further substantiated on arrival of the analysis of the lickhole. Then, why did they eat the earth? It is an old truism that there is never effect without a cause. I maintained—and do so now—that the sheep ate it by instinct, because it was beneficial to them. I further experimented with this earth by mixing a quantity of it with salt, letting some 200 very weak and wormy and flukey sheep have free access to it in a paddock where there was no lickhole, and I concluded that the sheep did improve and the deaths decreased, and I could not attribute the improvement to any other cause than the lickhole earth. After due consideration I concluded that this was the starting point of a discovery of something that would result in a benefit to stock—particularly sheep—because the analysis proved that the sheep were eating a well-defined though weak combination of chemicals. It now occurred to me that the formulæ of the lickhole resembled an iron ore in composition; then, again, my experience contributed the fact that ironstone localities were sounder than other country, such as sandstone country. There seemed to me to be a connection here. I obtained about 10 lb. of the most likely looking ironstone I could find, powdered it as finely as possible, mixed it 1 to 4 with Liverpool salt, then selected twenty-five very wormy sheep showing bottle-jaw and other symptoms of disease, and allowed them to have free access to the mixture. They showed a very sharp improvement towards health. In about three weeks the skins and eyes were showing a good healthy colour, the bottle-jaw had left them, and they gradually improved in health. (Before treatment they could not have been in a worse condition.) Later, they got into condition fit to kill for rations. I killed one. There were still a good many worms in the stomach (small red), but the animal had wonderfully improved in blood condition. In fact, it was in a very healthy condition, and plenty of it. There was no doubt that the sheep had made a very large quantity of blood, and, considering that I had no guarantee that the ironstone used was of the best quality (no analysis was made), I was very pleased with the result,

because it showed an improvement on the ore over the lickhole earth, and a connection between the two ores or deposits was established; consequently, the paddock that I obtained this ironstone from had the reputation of being the only sound paddock in that part of the district, and the overseer told me himself that he never had sheep die in it, though he had at times put very flukey and wormy sheep in it, and they always benefited by the change. In this paddock there was an ironstone hill, and I put it under close observation in the following manner:—In the early morning sheep always move off from their camping ground in an easterly direction. Knowing this, I would frequently secrete myself on this ironstone hill and, with the aid of a pair of field-glasses, observe the habits of the sheep. Time and again I observed that the sheep licked the iron dust from the stones, and repeatedly they would turn the smaller and loose stones over with their nose apparently for no other purpose than to get any iron dust that might be there; and after a general study of this paddock I was—and am now—convinced that the run owed its good reputation to the available iron dust the rocks contained. At this stage I reluctantly left it, and have not had any further *practical* experience with it. But I fairly, squarely, and honestly believe that, if the principle is followed as far as it takes me—*i.e.*, if the following ores (iron and mispickel) are taken and finely powdered and mixed 1 to 4, and the whole mixed 1 to 4 with Liverpool salt, and the stock given free access to it in their troughs—we would have done with many diseases in sheep and cattle. I believe that animals treated with this mixture would live according to nature in the highest and finest sense. By virtue of the first-rate general tonic and building-up properties of these ores, which would keep sheep in a perfectly healthy condition, stock treated with it should certainly improve in condition and be proof against diseases that might otherwise attack them. With regard to cattle, it would give grown stock the same resisting power against tick fever that a young calf always enjoys without the diminishing degree. The reason for this degree of immunity (in the calf) is that power to manufacture fresh red blood cells is very great in young animals, and the destruction of these cells caused by the organisms of tick fever is not greater than the young animal's vital power can cope with. As regards the arsenic contained in mispickel ore, it being in chemical combination with the iron (principally) ensures its perfect distribution throughout the whole, and in the proportion in which it is present there is not the slightest danger in its administration, and being present principally as arsenate of iron it is gradually absorbed in the stomach without irritation. The value of arsenical treatment for worms in sheep needs no comment by me, being so well known.

ANALYSIS OF CRUDE IRON ORE.

	Per cent.
Ferrie oxide	42.33
Manganese oxide	.95
Lime	7.44
Potash	.27
Carbon dioxide	.12
Ferrous oxide	29.92
Alumina	7.86
Magnesia	3.82
Silica	5.82
Phosphoric acid	1.86

ANALYSIS OF MISPICKEL ORE (ARSENICAL PYRITES).

	Per cent.
Arsenic	25.60
Ferrous oxide	50.27
Sulphur	15.09
Silica	7.15
Copper	traces

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, DECEMBER, 1917.

The past month has been characterised by continuous rain, and conditions have not been in favour of high egg production. The total number of eggs laid for the month was 8,091. In the light brood section, E. Chester's pen laid the highest monthly total of 154 eggs, and in the heavy breed section the pen of the Mars Poultry Farm lead with a total of 138. The following are the individual returns:—

Competitors.	Breed.	Dec.	Total.
LIGHT BREEDS.			
E. Chester	White Leghorns ...	154	1,240
G. Chester	Do.	115	1,082
*J. M. Manson	Do.	137	1,078
*G. H. Turner	Do.	111	1,069
F. W. Leney	Do.	125	1,067
Oaklands Poultry Farm ...	Do.	135	1,060
W. Becker	Do.	122	1,058
W. R. Crust	Do.	127	1,050
Kelvin Poultry Farm ...	Do.	109	1,018
T. A. Pettigrove, Victoria	Do.	112	1,008
T. Taylor	Do.	124	1,008
*A. T. Coomber	Do.	127	1,001
*J. R. Wilson	Do.	130	999
Chris. Porter	Do.	87	996
*J. Zahl	Do.	113	993
Moritz Bros., S.A. ...	Do.	105	988
D. Fulton	Do.	128	982
Quinn's Post Poultry Farm	Do.	105	959
*Mrs. J. D. R. Munro ...	Do.	118	953
A. Shillig	Do.	92	944
J. G. Ritcher	Do.	110	935
*Dixie Egg Plant	Do.	116	935
A. H. Padman, S.A. ...	Do.	102	927
T. B. Hawkins	Do.	105	925
J. L. Newton	Do.	110	913
*T. Fanning	Do.	103	908
Mars Poultry Farm ...	Do.	103	903
*A. W. Bailey	Do.	110	901
F. Clayton, N.S.W. ...	Do.	125	900
Mrs. Bradburn, N.S.W. ...	Do.	122	899
C. Knoblauch	Do.	123	891
J. Holmes	Do.	125	883
Mrs. S. J. Sears	Do.	126	880
E. Cross	Do.	128	877
G. J. White	Do.	128	873
C. H. Singer	Do.	127	866
L. G. Innes	Do.	107	864
C. P. Buchanan	Do.	120	861
R. Holmes	Do.	81	857
S. C. Chapman	Brown Leghorns ...	110	854
G. Howard	White Leghorns ...	88	848
Geo. Williams	Do.	103	848

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	Dec.	Total.
LIGHT BREEDS— <i>continued.</i>			
J. Ferguson	White Leghorns ...	119	841
*A. E. Walters	Do.	102	836
Miss M. Hintz	Do.	119	822
Mrs. J. Carruthers	Do.	113	801
*C. C. Dennis	Do.	33	785
*Dr. E. C. Jennings	Do.	108	768
HEAVY BREEDS.			
*R. Burns	Black Orpingtons ...	132	1,159
*Mars Poultry Farm	Do.	138	1,083
W. Smith	Do.	110	1,051
E. A. Walters	Do.	119	1,036
*E. F. Dennis	Do.	114	971
W. S. Hanson, N.S.W.	Do.	98	959
F. A. Claussen	Rhode Island Reds ...	99	940
*E. A. Smith	Black Orpingtons ...	112	897
Mrs. J. H. Jobling, N.S.W.	Do.	99	896
H. Jobling, N.S.W.	Do.	110	878
D. Kenway	Do.	102	875
Cowan Bros., N.S.W.	Do.	94	865
P. C. McDonnell	Do.	85	854
King and Watson, N.S.W.	Do.	106	821
C. B. Bertelsmeier, S.A.	Do.	110	816
*Miss M. Hintz	Do.	97	815
*Oakland Poultry Farm	Do.	94	811
R. Burns	S. L. Wyandottes ...	106	790
E. Morris	Black Orpingtons ...	106	786
J. M. Manson	Do.	115	783
*Kelvin Poultry Farm	Plymouth Rocks ...	101	742
C. C. Dennis	White Wyandottes ...	88	729
*F. W. Leney	Rhode Island Reds ...	79	653
F. Clayton, N.S.W.	Do.	58	633
Totals	...	7,914	65,797

* Indicates that the birds are engaged in single hen test.

DETAILS OF SINGLE HEN PENS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
J. M. Manson	180	187	157	173	179	202	1,078
G. H. Turner	149	158	194	199	170	199	1,069
A. T. Coomber	174	113	193	178	176	167	1,001
J. R. Wilson	184	165	163	179	143	165	999
J. Zahl	190	110	197	119	205	172	993
Mrs. Munro	203	151	138	150	126	185	953
Dixie Egg Plant	145	183	175	181	175	76	935
T. Fanning	126	162	173	143	129	175	908
A. W. Bailey	36	160	181	180	173	171	901
A. E. Walters	115	120	139	166	145	151	836
C. C. Dennis	156	89	77	148	153	162	785
Dr. Jennings	101	95	144	141	172	122	775

EGG-LAYING COMPETITION—*continued.*
DETAILS OF SINGLE HEN PENS—*continued.*

Competitors.	A.	B.	C.	D.	E.	F.	Total.
HEAVY BREEDS.							
R. Burns	169	148	210	158	214	260	1,159
Mars Poultry Farm	169	199	173	180	187	175	1,083
E. F. Dennis	195	176	166	206	192	36	971
E. A. Smith	151	149	112	178	156	151	897
Miss M. Hintz	141	122	119	149	149	135	815
Oaklands Poultry Farm... ..	189	121	108	103	179	111	811
Kelvin Poultry Farm	114	115	124	170	88	131	742
F. W. Leney	111	126	91	103	114	108	653

POULTRY HOUSES.

The following notes on the construction of chicken houses, with the illustrations, are taken from a very instructive circular prepared by Ross M. Sherwood, specialist in poultry husbandry and head of the Department of Poultry Husbandry during 1916-1917, Kansas (U.S.A.), State Agricultural College:—

SIZE OF THE HOUSE.

The size of the house is governed largely by the breed of fowls, the amount of protection provided outside the chicken house, and the section of the state in which

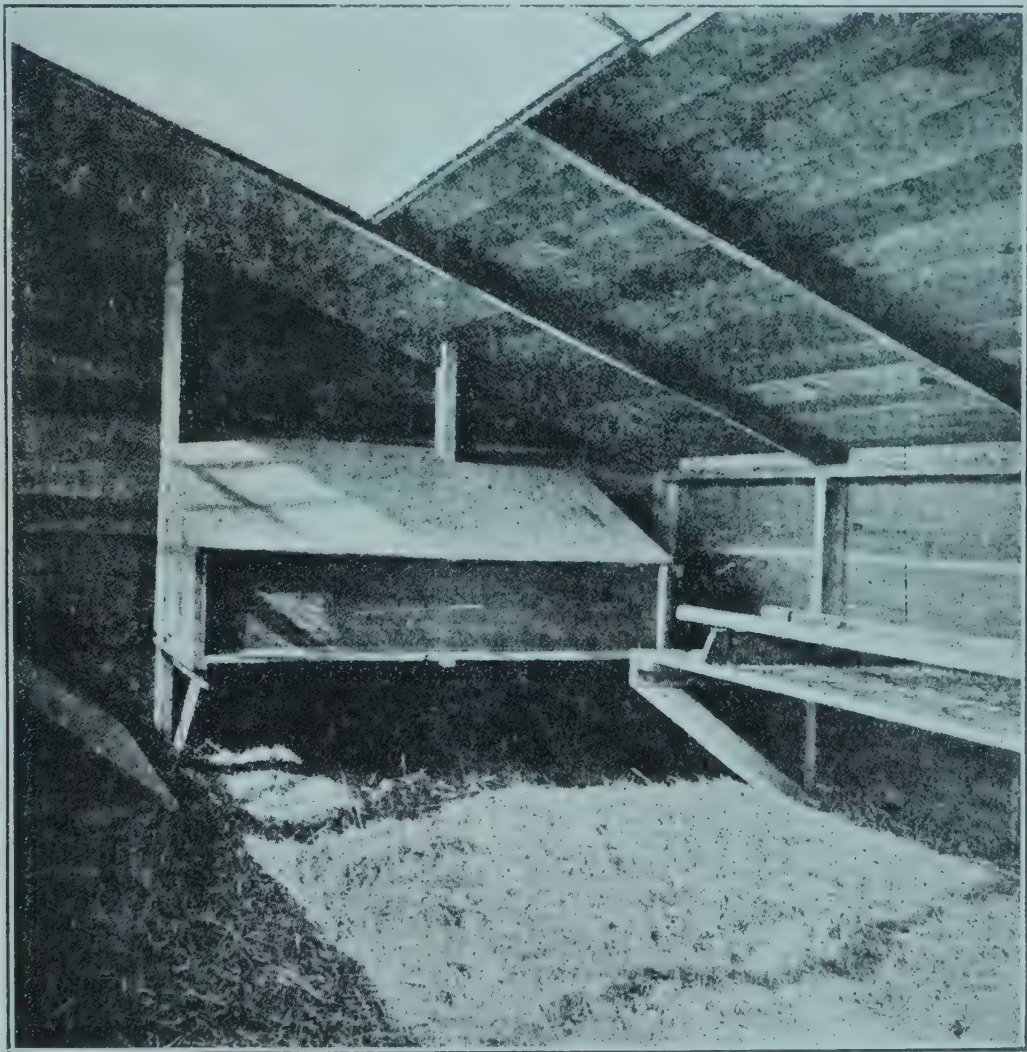


Fig. 1.—Interior of house, showing arrangement of perches above the dropping board, and nests at the end of the house.

the farm is located. The farmers of Kansas who get the most winter eggs provide a scratching room where the hens are given grain feed in a deep litter of straw or similar material. The fowls are kept in this room whenever the weather is not satisfactory for them to run at large. This scratching room should allow from three to five square feet of floor space for each hen. Heavy breeds, and fowls confined a great part of the time, require the larger space, while those which range most of the time may have the smaller floor space. Crowding of fowls does not give satisfactory results. Another room may be used for roosting, or a dropping board may be placed in the scratching room about thirty inches above the floor, and the perches placed six or eight inches above it, as shown in Fig. 1. This is an economical plan, because it eliminates the necessity of providing a separate roosting room.

VENTILATION.

There is no best method of providing ventilation. The two methods most common in Kansas are the curtain front and the open front. The open front is giving excellent results in some sections of the State, but many people find it desirable to have curtains that may be placed over most of the openings during bad weather. It has been found that a house closed on three sides and curtained tightly on the south does not provide enough fresh air. To remedy this, a narrow opening is often provided along the south side of the house just under the rafters. This causes a greater circulation of air than the curtained openings alone, yet does not allow the wind to blow on the fowls. The large curtained openings should be from thirty to thirty-six inches from the floor, so that the wind will not blow on the fowls when the curtains are raised. During the summer months other openings are necessary to make the building cool enough so that the fowls will roost there. These should be so located at the back of the house that draughts will not blow on the fowls during the night. These openings should be closed tightly during the winter months.

FLOORS.

Floors of portable houses are necessarily made of wood. For permanent houses, however, concrete and building-tile floors are coming rapidly into favour. Such floors are easily cleaned, rat proof, long lived, and practically as cheap as board floors. If properly constructed and well littered with straw, they are not cold or damp. If concrete floors are built, the moisture may be kept down by the use of a coarse rock floor foundation, as shown in Fig. 2.



Fig. 2.—Rock foundation for cement floor. This prevents the moisture from coming up from the soil below. A floor on such a foundation should be dry.

FIXTURES.

Poultry-house fixtures should be simple, few in number, and easily removed. They usually consist of a perch, with or without a dropping board, nests, a feeding shelf, and a broody coop.

The perches should provide six to eight inches of room for each fowl, and be fourteen inches apart. Overcrowding will very likely result in an epidemic of colds or roup. All perches should be on the same level, to avoid the crowding that results from the effort of all to roost on the top perch. The most common material used for perches is 2 in. by 3 in. lumber. This may be placed on edge and the upper edges rounded to avoid bruising the feet.

If it is desired to place nests under the perches or provide more space for scratching, a dropping board should be used. This should be made of good matched material, so that there will be a minimum of cracks for harbouring mites. It should be removable, so that the ends may be easily sprayed.

A nest should be roomy, easily cleaned and sprayed, dark, and conveniently located. For most fowls a nest fourteen inches square and six inches deep is a good size. There should be one nest for every five hens in a farm flock of ordinary size. Hens are quite likely to roost on the edges of the nests during the molting season,

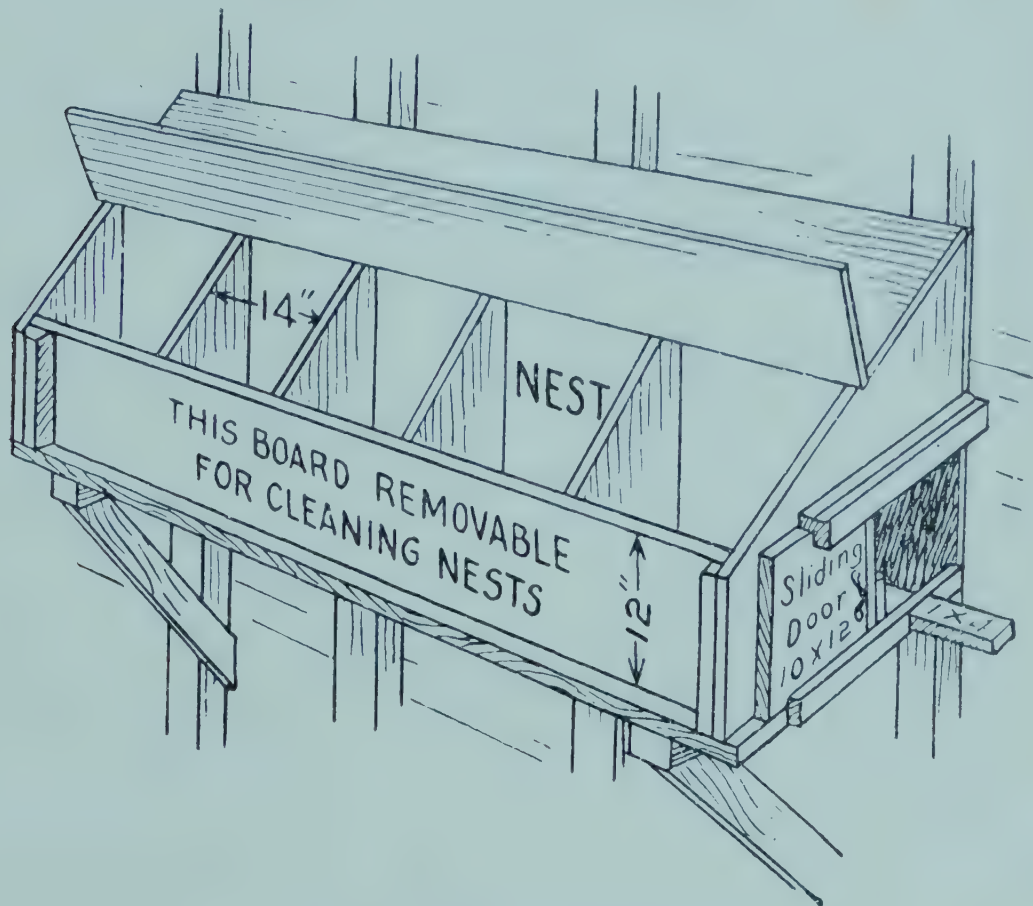


Fig. 3.—A good type of wall nest.

owing to the fact that their bodies are tender from the growing feathers and they try to escape the crowded perch. It is a great advantage to be able to close the nests at the time of the evening feeding. This may be accomplished by means of a slide door, as shown in Fig. 3.

A feeding shelf may be constructed to keep the feed hopper and water pan up out of the way of the floor litter as it is scratched about by the flock. A dry-mash

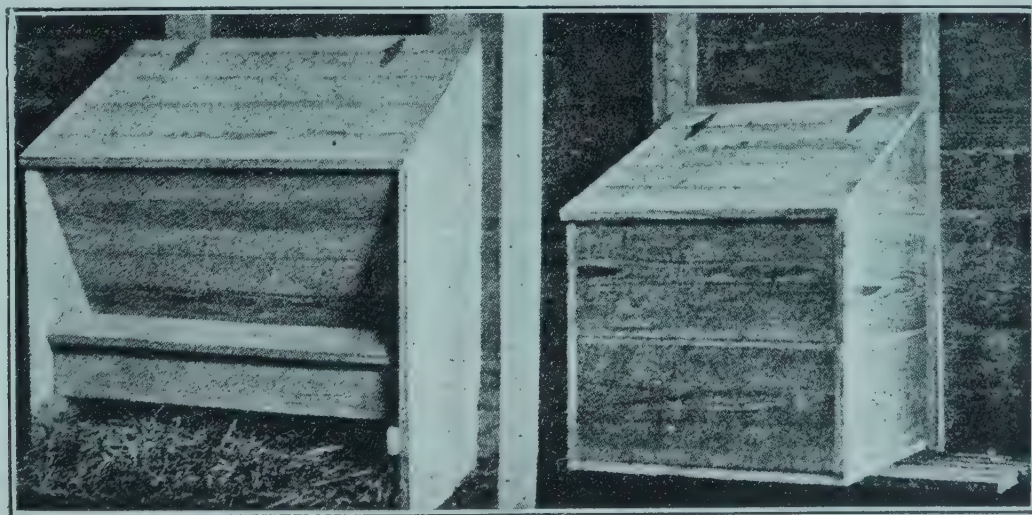


Fig. 4.—Mash hopper to left. Grain bin to right.

hopper and grain bin, as shown in Fig. 4, are very useful in the chicken house. The bin makes it possible to have a supply of grain near at hand.

A broody coop is a convenience in every chicken house for breaking up broody hens. It should be provided with a slatted bottom, so that it will be self-cleaning and there can be no accumulation of nesting material.

CARING FOR THE CHICKEN HOUSE.

The chicken house should be littered at all times with straw eight to twelve inches deep. This should be renewed whenever it becomes damp, badly broken up, or so full of droppings that grains thrown down are not quickly lost from sight.

When a dropping board is used it should be cleaned at least once a week, because disease germs and mites accumulate on it. Further, if not cleaned frequently the feet of the birds become soiled, causing a large per cent. of dirty eggs. Also, injurious gases are given off by the decaying manure.

As a matter of precaution against disease and insects, the chicken house should be thoroughly cleaned at least once a year, and soaked in every part with a 3 per cent. mixture of compound solution of cresol or a good stock dip.

The two most common poultry parasites are mites and lice. Mites are usually first noticed on the under side of the perches or in the corners of the nests where they live, rather than on the fowl's body. They stay on the body of the fowl only long enough to feed. Mites are killed by spraying. In order to get entirely rid of them it is necessary to spray two or three times to kill the mites which have hatched after the previous spraying. In warm weather the sprayings should follow each other at intervals of five to seven days. If it is cool, ten days will be sufficient.

The chicken louse spends most of its life on the fowl, and is thus not affected by cleaning or spraying. It is controlled by dust baths, dust powders, and blue ointment. A good, cheap lice powder can be made by mixing three parts of gasoline with one part of cresol, and gradually stirring in plaster of paris or building cement to take up the moisture. After drying, this mixture is ready for applying to mature fowls. It should be applied thoroughly.

Blue ointment may be purchased from a drug store and mixed with equal parts of vaseline. A piece of the mixture about the size of a pea should be thoroughly rubbed into the fluff of each fowl, close to the vent. A second application should be made eight or ten days later to kill the lice which hatch after the first application.

A whitewash is also good in keeping parasites and disease in check. A good whitewash is made as follows:—Slack one bushel of lime in a container, and add water until twelve gallons have been used. In another vessel dissolve 2 lb. salt and 1 lb. of sulphate of zinc in two gallons of water. After these are dissolved add the mixture and two gallons of sweet skimmed milk to the lime water.

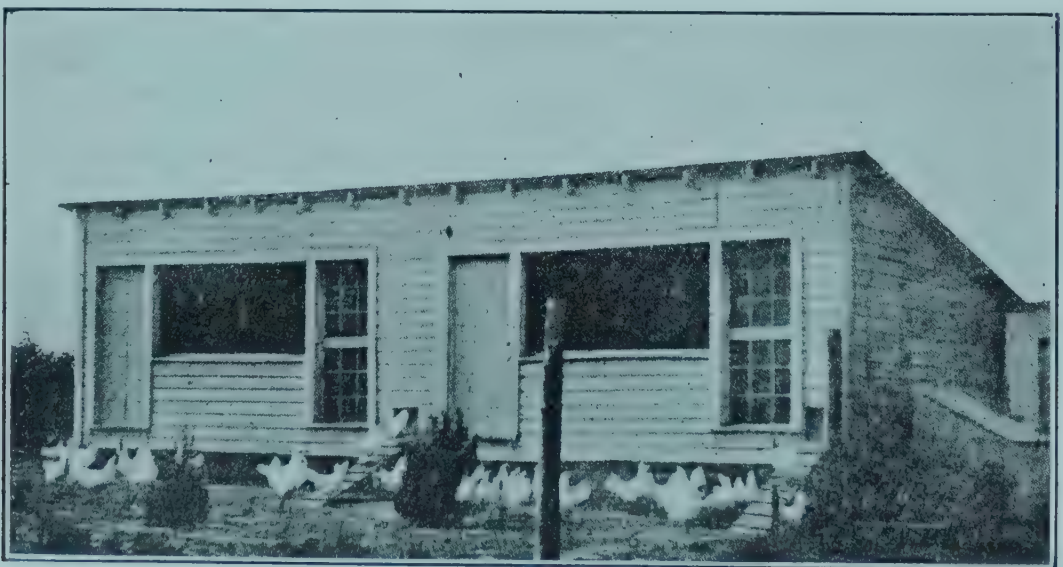


Fig. 5.—Shed-roof chicken house having good light and ventilation.

Fig. 5 shows the wall construction and front ventilation of a shed-roof chicken house. The openings in the front have muslin curtains, which may be closed in severe weather. There are openings on the back side, just below the roof, for use during the summer time. These are so arranged that draughts do not blow on the fowls. Doors are shown above the front openings. These may be used if it is found necessary.

The floor plan of this house is shown in Fig. 6. This gives the arrangement of nests, roosts over dropping board, broody coop to confine broody hens, and platform for mash hopper and water bucket.

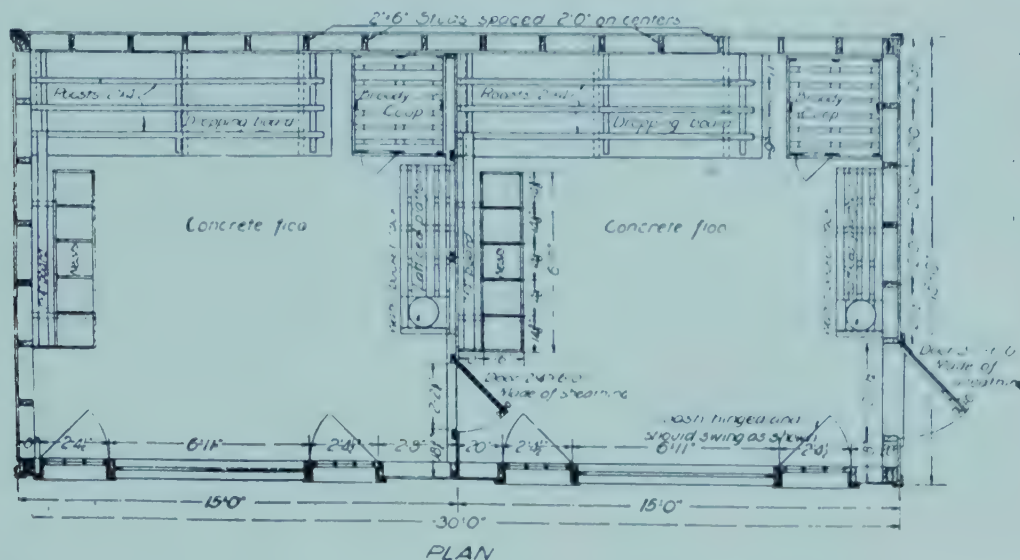


Fig. 6.—Floor plan of house shown in Fig. 5.



Fig. 7.—Stone chicken house which is giving good results on a Kansas farm.

The shed-roof house shown in Fig. 7 is giving good results on a farm in northern Kansas. Originally this house was much narrower, an addition being made later. Had the entire house been built at one time it probably would have been made lower. As it is, it is higher than is necessary, both in the front and in the back. This house is well ventilated, as indicated by the large number of openings. The openings in the upper part of the front form an outlet for all bad air which may accumulate near the roof.

Fig. 8 shows a Kansas farmer's well-proportioned shed-roof chicken house. The openings in the front have muslin curtains, which may be lowered whenever the weather is severe enough to make it advisable. In this house the fowls roost along the back wall over dropping boards. The nests are similar to those shown in Fig. 3, except that they are two tiers high. They are built on both ends and on the partition,

which divides the house into two similar rooms. There is a room on one end of the house for the storage of feed. Such a room is very useful because it saves a great deal of time in feeding the fowls.



Fig. 8.—The ventilation is not overlooked in this house. The openings may be covered with curtains if weather demands.

The type of house illustrated in Fig. 9 is satisfactory when built about twenty feet wide. This house has an open front, with no curtains for protection. It has been used with good results in States farther north than Kansas for the medium-

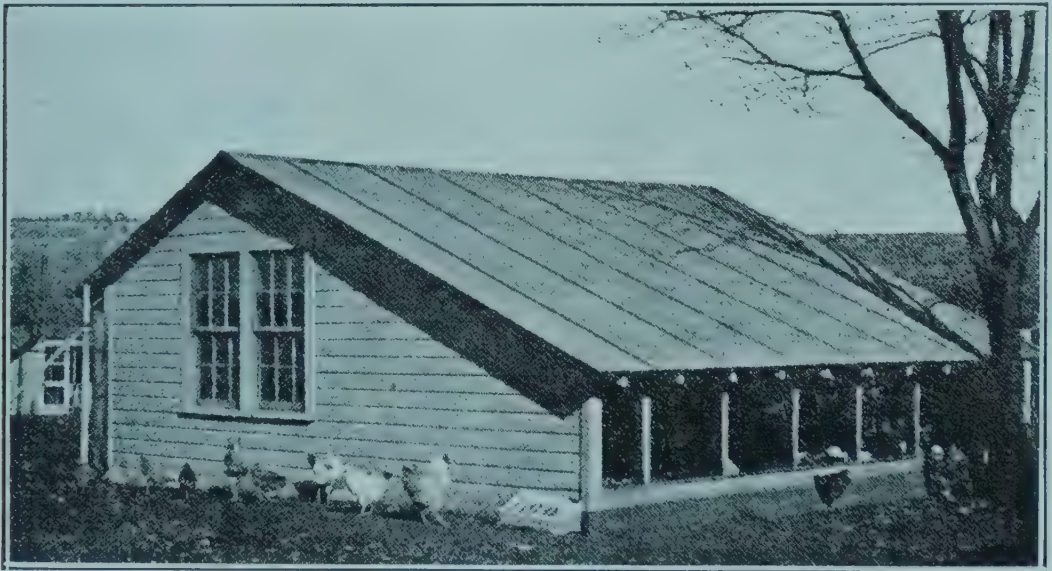


Fig. 9.—An open front hen house which is giving good results.

weight breeds. This house has windows on both the east and the west. It also has an opening along the north side, under the eaves, to provide summer ventilation.

The house shown in Fig. 10 may be used for hens or for growing chicks. It may be moved from place to place, so that the chickens may have fresh range. This is probably the cheapest type of house for a given floor space, unless it be a house with no side wall at all. The dimensions are 8 ft. by 8 ft. This type of house is often built 10 feet from front to back. The shape of roof is such that it may be moved easily between the rows of trees in an orchard.

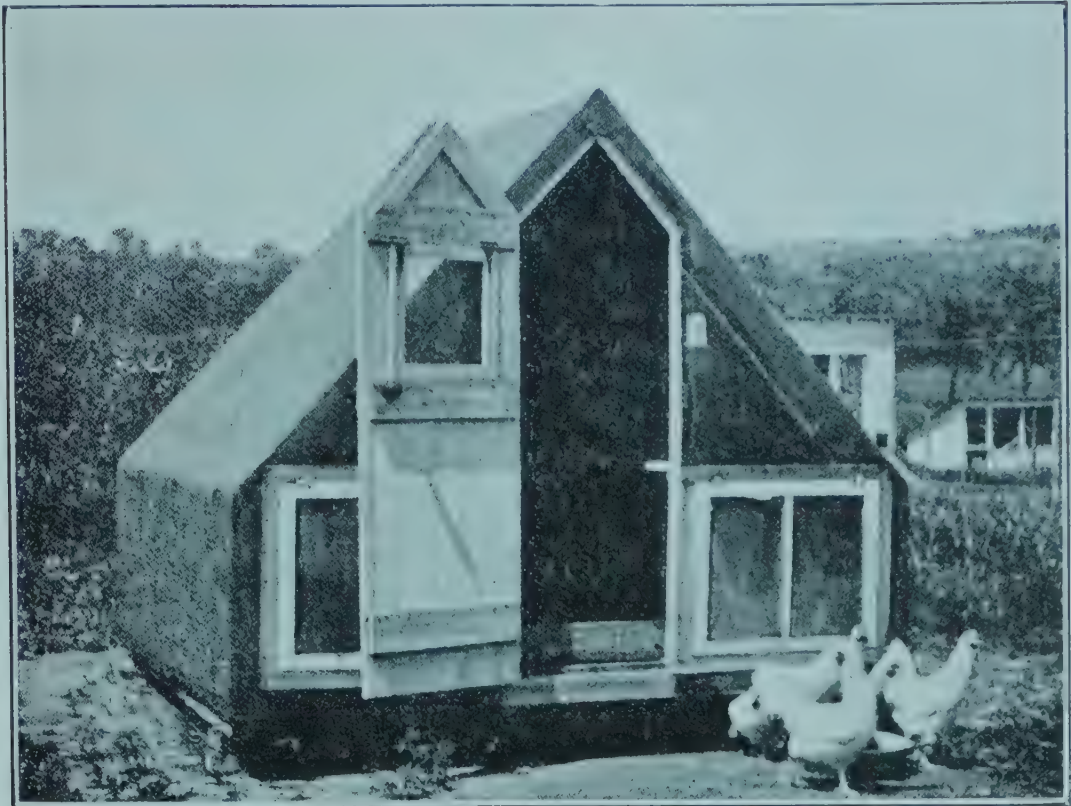


Fig. 10.—An economical house for either hens or growing chicks.

The floor plan of this house is shown in Fig. 11. The dotted lines are the joists for the floor.

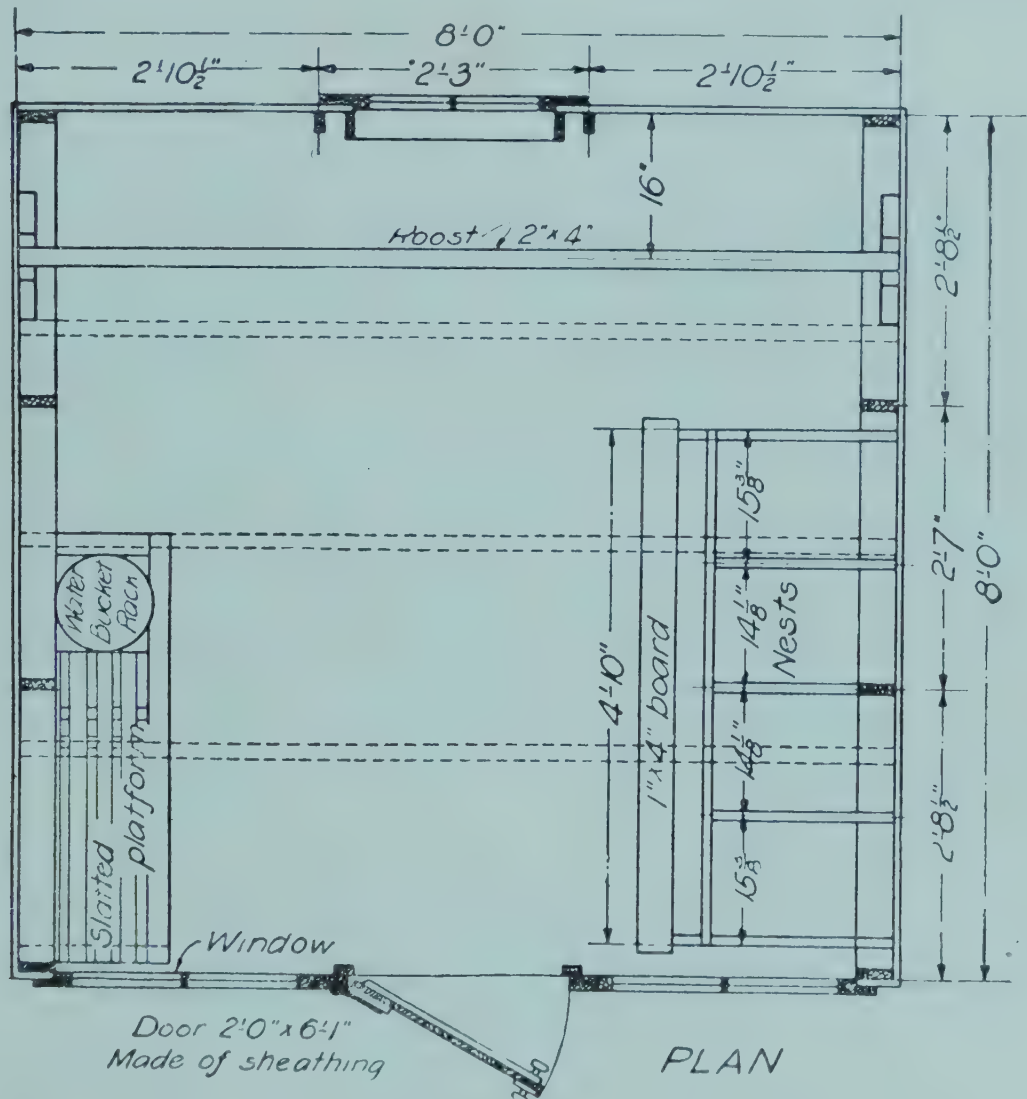


Fig. 11.—Floor plan of house shown in Fig 10 when used for laying hen .

Fig. 12 shows a house made from two piano boxes. There are enough boards in two boxes to make this entire house. The only added expense is the lower framework for the floor, roofing paper, windows, and hardware. This house may be used for growing chicks during the summer and for mature fowls during the rest of the season. It is a very practical type where piano boxes are available at a reasonable cost.

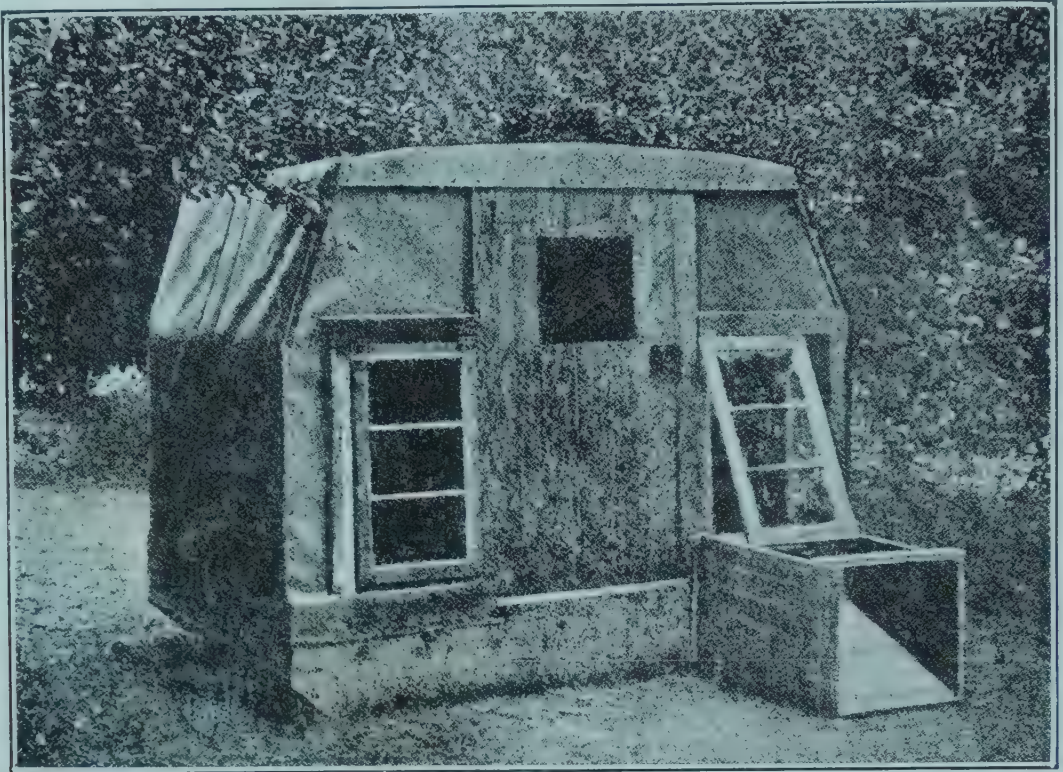


Fig. 12.—House made of two piano boxes covered with roofing paper.

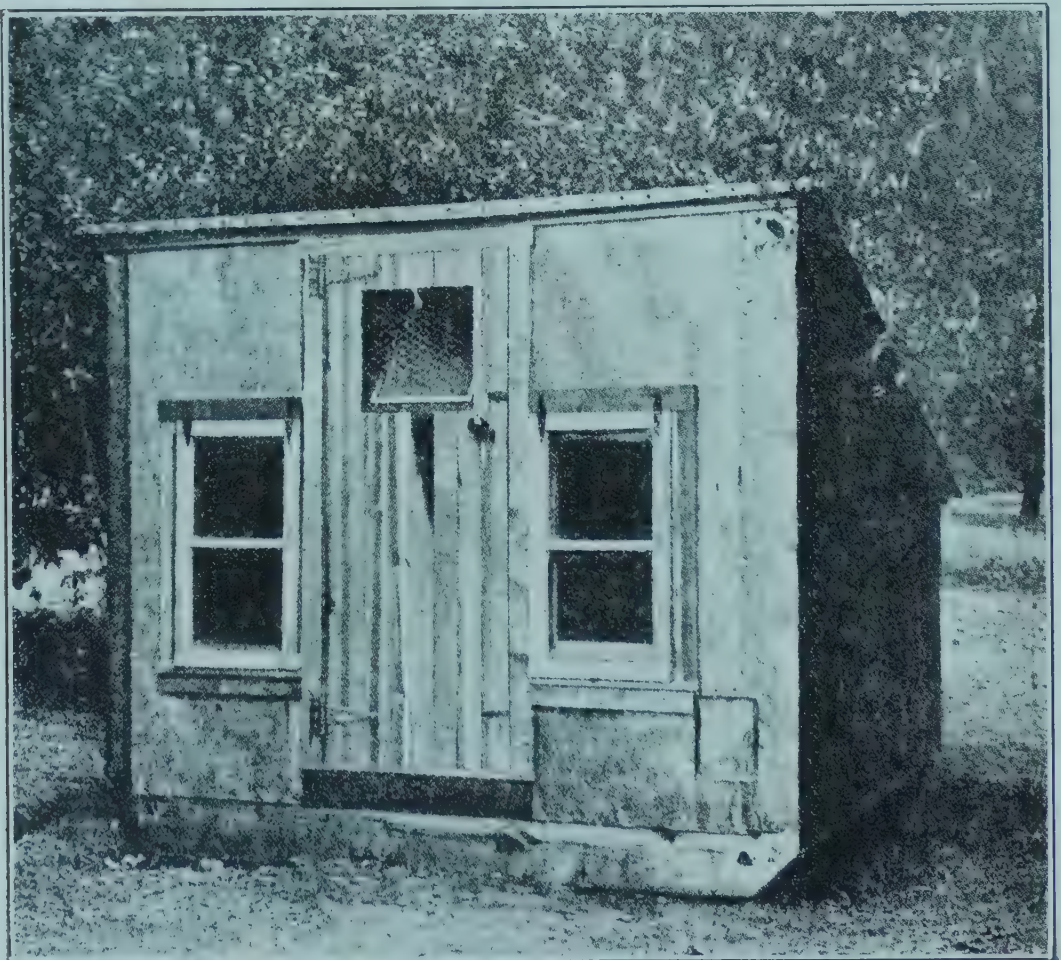


Fig. 13.—Shed-roof colony house for chicks or mature fowls.

For those who wish a shed-roof movable house for hens or growing chicks the house shown in Fig. 13 is suggested. It is necessary to provide more ventilation than is specified if it is used for mature fowls.

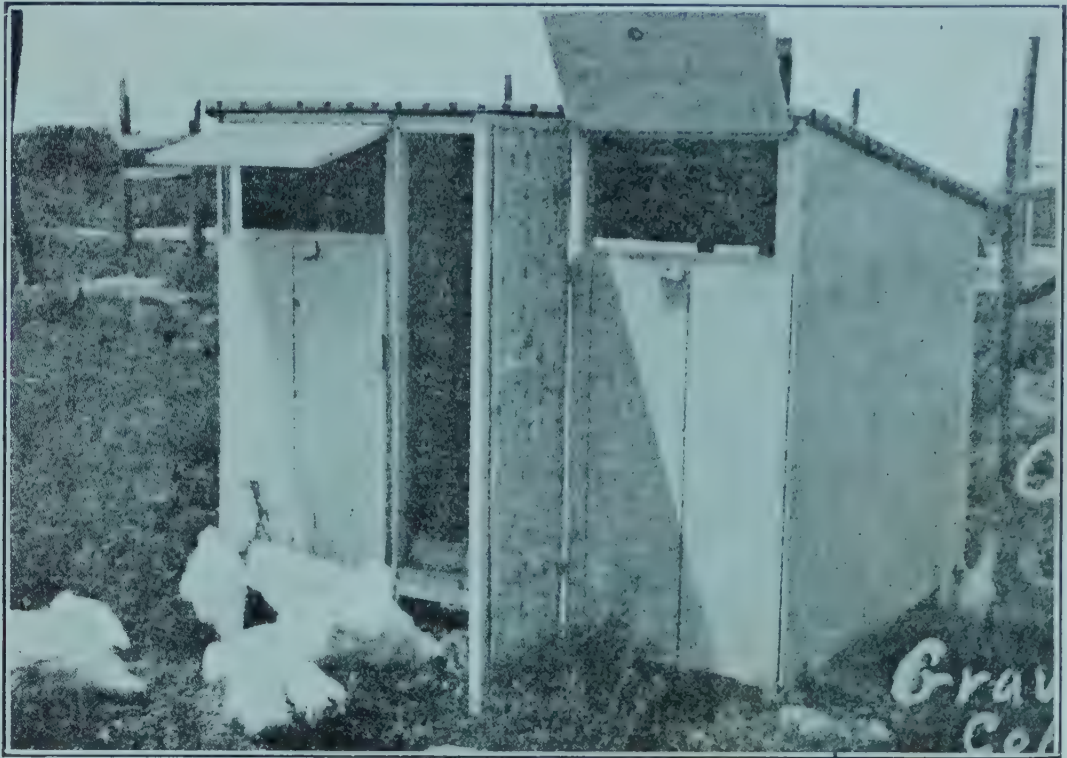


Fig. 14.—Economical coop for growing chicks. It is especially well ventilated.

A farmer in Southern Kansas has solved the problem of housing for a small flock of growing chicks by constructing the small house shown in Fig. 14. The building is sided with ship-lap on a light frame of 2 in. by 2 in. material. It is covered with prepared roofing. Ventilation is well provided for. There is a long, narrow door under the eaves on the back side as well as the two doors on the south side. By properly operating the doors the house may be kept comfortable for the chicks.

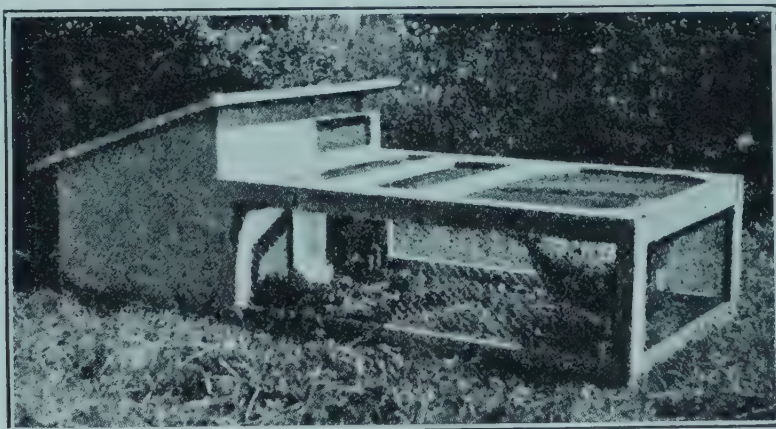


Fig. 15.—Coop and yard for hen and chicks. Chicks are protected from their enemies in such a coop.

The broody coop shown in Fig. 15 is very useful for a hen and chicks, or for a sitting hen. Such a coop should be provided with a tight floor. It will then protect chicks from surface water and rats. The yard makes it possible to confine the chicks while the grass is wet. If hens are confined in such coops until the chicks are several weeks old, the loss of chicks will be much smaller than is often the case.

Fig. 16 shows a very useful and economical broody coop. This is made from a large, tight box with prepared roofing paper fastened over the top for a roof. The door at the front is covered with $\frac{1}{4}$ in. mesh hardware cloth to protect the chicks from enemies without depriving them of proper ventilation. This coop may also be used for sitting hens.

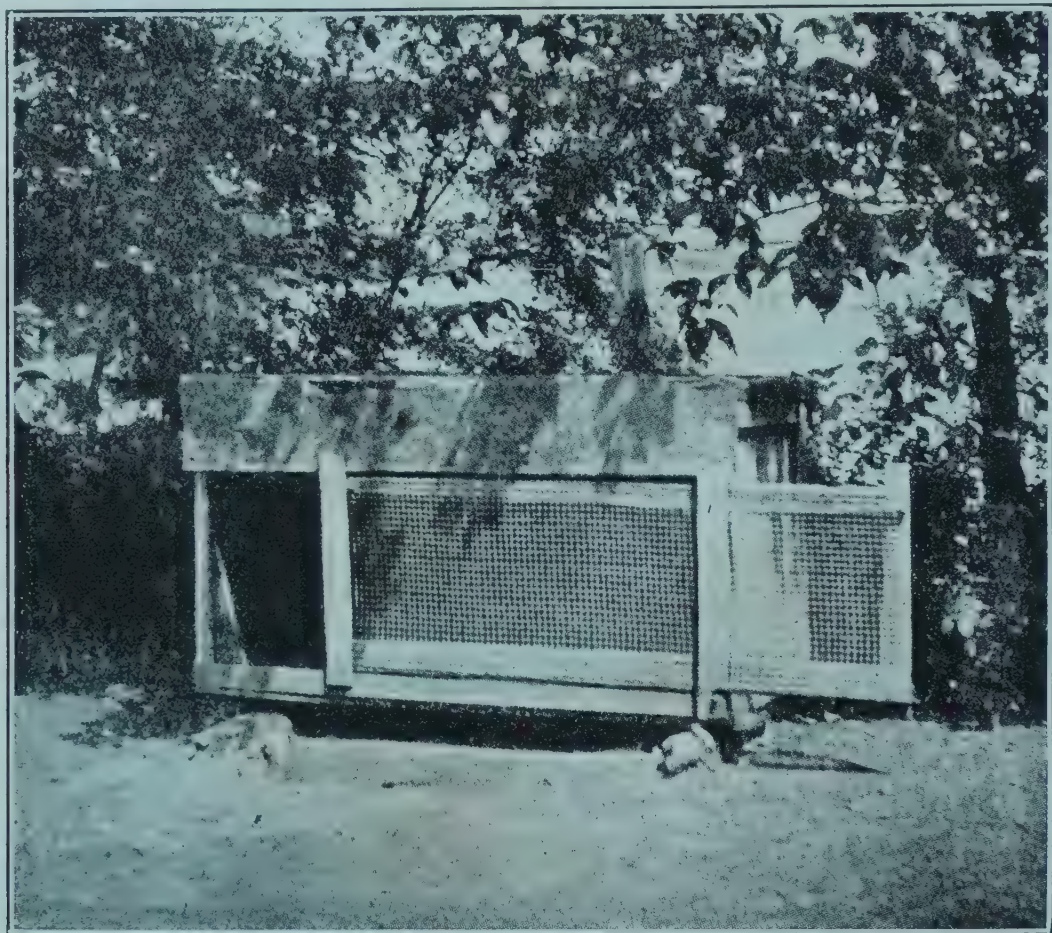


Fig. 16.—Excellent broody coop made from large tight box covered with roofing paper.

SOLAR OVENS.

In view of the scarcity of coal or wood in many subtropical regions, such as Egypt, the Punjab, and the Karoo of South Africa, it is interesting to note the report recently made by Sir F. Nicholson, describing valuable experiments in the employment of solar ovens. These consist of stout teakwood boxes, blackened inside and fitted with a double glass top. They are suitably insulated, and with this simple apparatus a temperature of from 240 degrees to 275 degrees Fahr. is easily obtained during the middle of the day from 11 a.m. to 3 p.m., and 290 degrees with the aid of a single glass mirror. The oven once constructed, the "Journal of the Royal Society of Arts" for 11th May, 1917, points out, costs nothing, and for all mere baking or cooking purposes it is a very efficient and cheap utilisation of sun-heat, suitable for many applications. The disadvantage attached to the process—namely, the hours possible for hot meals being reduced to those in the hottest period of the day—must not be overlooked.—"Agricultural News of Barbados."

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RETURNS OF COWS FROM 27TH NOVEMBER TO 26TH DECEMBER, 1917.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%.	Lb.	
Sweet Meadows ...	Jersey ...	8 Aug., 1917	610	6·8	49·23	Slipped calf.
Miss Edition ...	„ ...	12 Nov. „	874	4·2	34·14	
Iron Plate ...	„ ...	14 Oct. „	850	4·2	41·96	
Hedge's Dutchmaid	Holstein ...	9 Sept. „	817	4·3	41·27	
Auntie's Lass ...	Ayrshire ...	5 July „	898	3·7	38·97	
Violette's Peer's Girl	Jersey ...	26 Oct. „	646	5·0	38·13	
Nina ...	Shorthorn...	6 Sept. „	835	3·9	38·02	
Thornton Fairetta	Jersey ...	30 June „	476	6·7	37·83	
Miss Bell ...	„ ...	27 June „	587	5·4	37·46	
Princess Kate ...	Ayrshire ...	28 June „	603	5·0	35·58	
College Bluebell ...	Jersey ...	28 June „	720	4·2	35·54	
College Damsel ...	Holstein ...	12 July „	817	3·7	35·41	
Netherton Belle ...	Ayrshire ...	17 July „	689	4·3	34·85	
Netherhall Queen	„ ...	30 June „	771	3·8	34·34	
Kate						
Lady Annette ...	„ ...	19 Oct. „	687	4·2	33·91	
La Hurette Hope	Jersey ...	22 Aug. „	544	5·1	32·76	
Buttercup ...	Shorthorn...	2 June „	753	3·7	32·64	
Lady Dorset ...	Ayrshire ...	14 Aug. „	721	3·8	32·13	
Lady Melba ...	Holstein ...	12 July „	661	4·1	31·82	
Lady Loch II. ...	Ayrshire ...	3 June „	668	4·0	31·36	
Burlesque ...	Jersey ...	8 Oct. „	483	5·3	31·25	
Glow VI. ...	Guernsey ...	9 Nov. „	714	3·7	30·95	
Skylark ...	Ayrshire ...	24 May „	584	4·3	29·54	
Miss Betty ...	Jersey ...	27 Mar. „	529	4·7	29·31	
College St. Margaret	„ ...	9 Nov. „	561	4·4	29·05	
Songstress ...	Ayrshire ...	1 Oct. „	632	3·9	28·92	
Rosine ...	„ ...	21 June „	627	3·8	27·93	
College Ma Petite	Jersey ...	10 Nov. „	594	4·0	27·89	
Lilia ...	Ayrshire ...	11 July „	650	3·6	27·41	
Glade ...	Shorthorn...	29 Mar. „	466	4·8	26·36	
Confidence ...	Ayrshire ...	25 June „	588	3·8	26·19	
Miss Security ...	„ ...	27 Mar. „	530	4·2	26·17	
Hedge's Madge ...	Holstein ...	22 Mar. „	491	4·4	25·43	
College Mermaid ...	Jersey ...	21 Aug. „	458	4·7	25·31	
Prim ...	Holstein ...	3 Aug. „	759	2·8	24·67	
Leonie ...	Ayrshire ...	4 Sept. „	587	3·5	24·03	
Windyhill Davidina	„ ...	2 July „	496	4·1	23·88	
Lady Mitchell ...	Holstein ...	26 Sept. „	613	3·2	22·88	
Lerida II. ...	Ayrshire ...	2 June „	463	4·2	22·84	

The Orchard.

EXPERIMENTS IN CONNECTION WITH THE DESTRUCTION OF INSECT PESTS OF THE TOMATO.

In May last, the Director of Fruit Culture, Mr. A. H. Benson, with the view of assisting tomato-growers and others to prevent the serious losses of these crops due to the ravages of the tomato moth, by destroying the larvæ, arranged with the Committee of the Wynnum Fruitgrowers' Association to carry out a series of experiments to test the efficacy of certain sprays and various forms of lantern traps. The experiments were carried out on the properties of Mr. Randall, of Wynnum South, and Mr. Hargreaves, Manly, under the direction of Mr. Inspector Leslie. Mr. Randall reported that on the plots sprayed with arsenate of lead the best results were obtained, as the percentage of waste was very light.

Other insecticides were not as efficacious as arsenate of lead. In the control plots the percentage of loss was very much greater both with disease and grubby fruit, and the foliage withered before that of the sections treated.

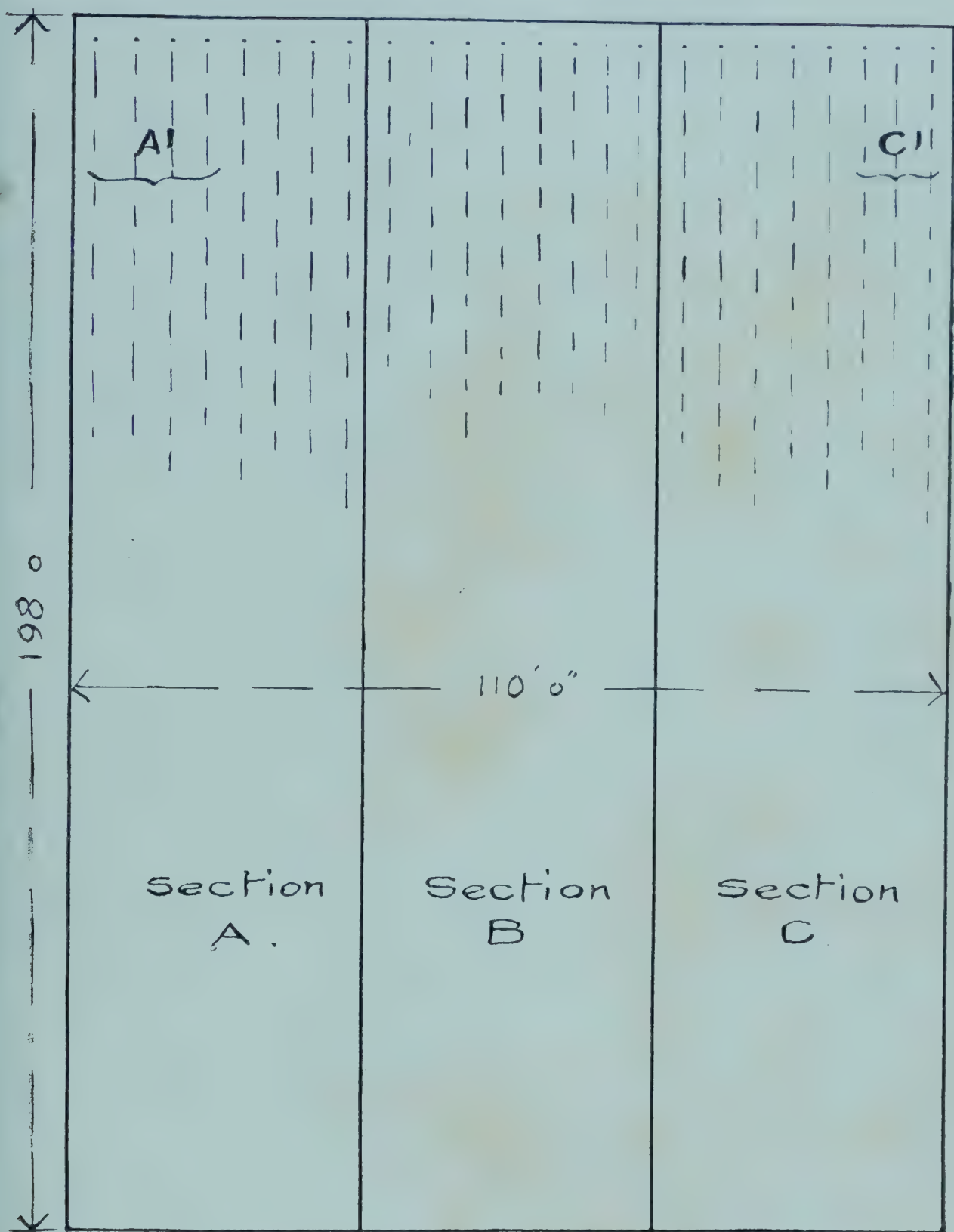
Mr. Hargreaves also states that the general quality of the fruit was superior in the treated sections, and that the spraying had a marked effect in reducing the waste.

Mr. Leslie summarises the result of the experiments as follows:—

1. Arsenate of lead proved the most satisfactory insecticide for the purpose.
2. The ordinary kerosine hurricane lamp, fixed as described and illustrated by him, proved most satisfactory as a trap lantern.
3. That the method of staking adopted was unsatisfactory.

The conditions under which the experiments were undertaken were:—

1. The Director of Fruit Culture undertook to
 - (a) Lay down a plot or series of plots in a certain district.
 - (b) To accept for consideration offers of suitable areas for the purpose.
 - (c) To supply materials, apparatus, and supervision necessary for carrying out of special work or experiments.
2. The grower whose offer was accepted would agree—
 - (a) To carry out the ordinary work of cleaning and cultivation.
 - (b) To reap and market the crop.
 - (c) To keep account of all work done, materials used, the crop, and its value.
 - (d) To allow access to plots and records by the Director and his officers, or anyone genuinely interested.



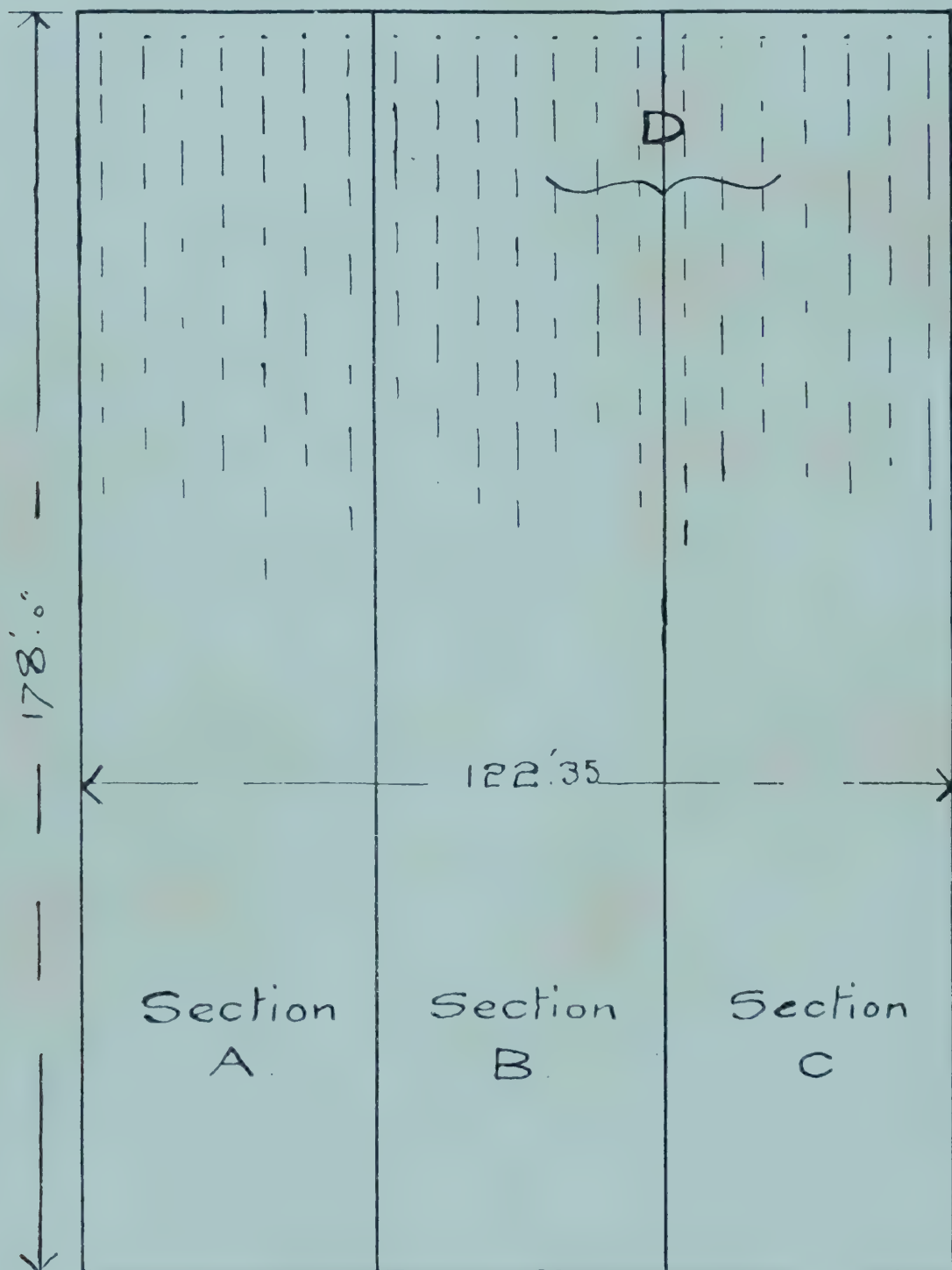
HARGREAVE'S PLOT.

3. It would be understood that the whole proceeds of the crop would belong to the grower.
4. At Wynnum the Director would supply stakes for the tomatoes, insecticides, and materials for trapping moths.

Mr. Inspector Leslie inspected two blocks, and chose those we have mentioned, as one was "new," the other "old" land, and the difference between results on new *versus* old land would thus be ascertainable.

We need not go into the cost of the experiments, which was really trivial, considering the results.

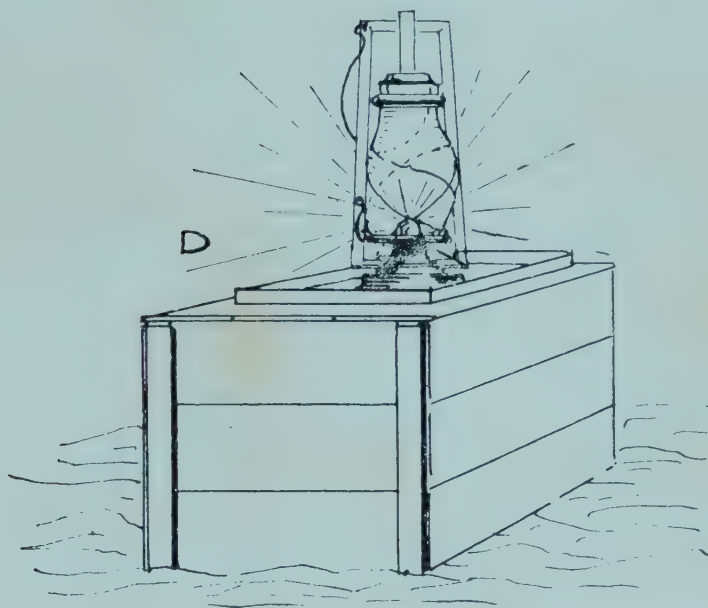
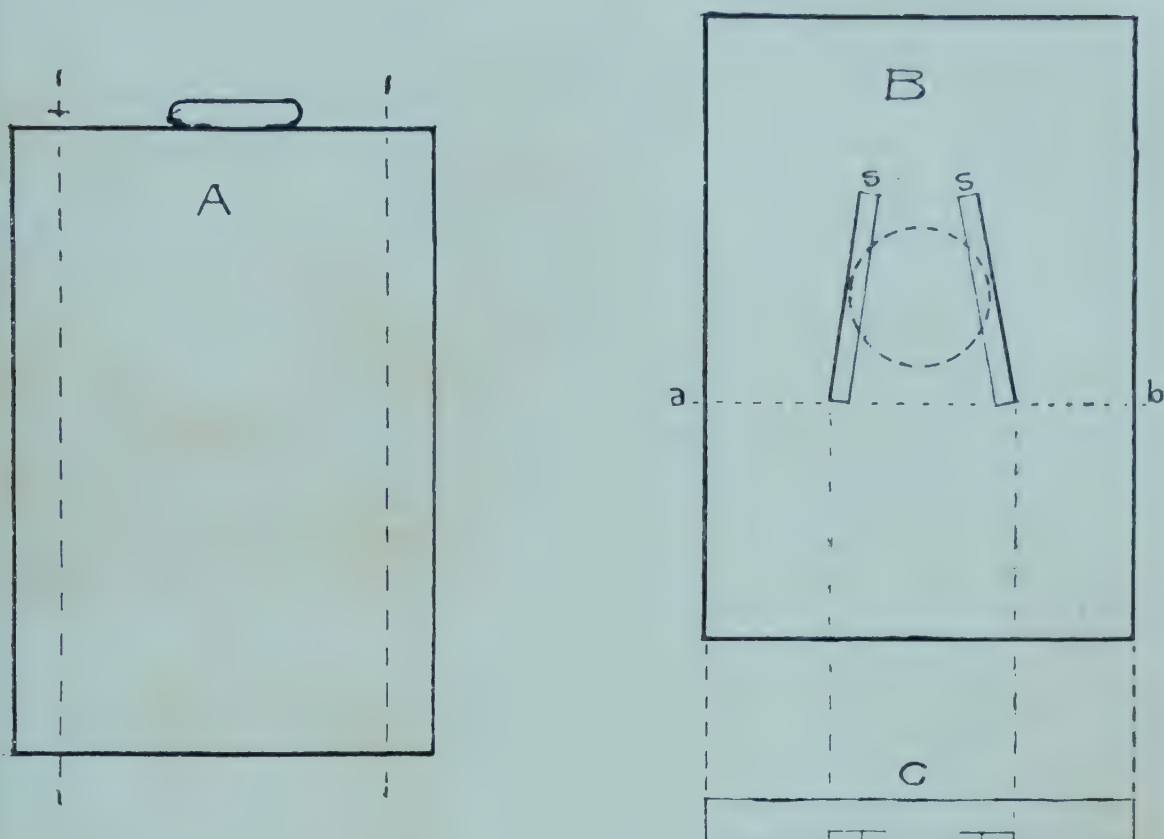
Mr. Leslie's report and diary describing the action of the trap-lamps are very informative, but the exigencies of space preclude our



RANDALL'S PLOT.

including them in these notes; but all information on the work done may be obtained on application to the Director of Fruit Culture.

As already stated, staking the plants proved conclusively that staking and tying were not satisfactory.



REFERENCE TO PHOTOS.

I. Hargreaves' Plot, 198 ft. by 110 ft., giving 21 rows of tomatoes, 3 sections.

II. Randall's Plot, 178 ft. by 122.35 ft.

III. Hurricane Lamp—

A.—Showing how to cut the tin, making two trays.

B.—Tray-plan, showing position of tin strips (s.s.) soldered to bottom along outside edge only (heavy lines). Dotted circle shows position for base of lamp.

C.—Section of tray at *a b*—Elevation.

D.—Lamp set in tray on empty fruit-case as used on plantation.

Viticulture.

HINTS TO GRAPEGROWERS.

By C. A. GATTINO.

(Continued from January, 1918.)

WINTER PRUNING.

Having brought the vines to their third year of growth, in accordance with my previous notes, we have to apply a practical method of pruning. The yearly pruning is a difficult subject to describe, and requires, to get the full value, practical lessons on the vines, because each country and district generally adopts a different and special system of pruning.

It is hard to say which of these special methods of pruning is best, as that can only be proved by comparative experiments in the same vineyards.

The climate, the soil, and the method of training the vines, all have great influence on the yearly pruning.

Speaking of vineyard culture, especially in these dry climates, I consider that, for slow growers and very hardy vines planted on rich soil, or strong growers planted on arid soil, the most suitable method would be the "back" or "stool" method. By this system the vine is made to form its head about 1 ft. above the ground. From this head the branches are allowed to start. At the next pruning, keep only the branches destined to be fruit-bearing, and cut them back from two to four eyes according to the vigour of the wood.

The vine will in time appear as a little tree, the fruit-bearing branches of which should be reasonably checked, thus preventing the overstraining of the energy of the vine, which, of course, would reduce the strength of the plant and future returns of fruit.

This method of pruning and training is the best and cheapest for vineyard culture of which I know; it does away with costly supports, trellises, &c., and makes the cultivation of the land, the pruning and spraying of the vines, and the gathering of the grapes easier and cheaper.

The method described is also the best adapted for dry climates, as the sap has not to travel so far or climb so high for the nourishment of the plant, and enables the vine to resist droughts, as the branches and wood are fed with a minimum supply of sap.

Dry pruning may be done at any time in the winter or in the fall, as soon as the leaves have dropped; but where there is danger of frosts, prune only towards the end of winter.

[TO BE CONTINUED.]

Tropical Industries.

INDIA'S SHARE IN THE RICE TRADE OF THE WORLD.

Intending ricegrowers in Queensland would do well to read the following position of the world's rice industry, published in the current number of the "Bulletin of the Imperial Institute," just issued (London: John Murray), which contains an article of seventy pages on the production and uses of rice. Practically all the rice-producing countries of the world are considered separately, in respect both of their rice crops and of their trade in rice, and an attempt is made to arrive at some idea of the world's production of this important foodstuff. It is calculated that the output of cleaned rice in 1916-17, in all countries except China, amounted to about 60,000,000 tons. Of this the British Empire produced about 36,000,000 tons, mostly in India, where the crop (including an allowance of 1,000,000 tons for native States) was no less than 35,000,000 tons. Of the foreign production of 24,000,000 tons, over 20,000,000 tons was grown in five countries—Japan, Netherlands East Indies (chiefly Java), French Indo-China, Siam, and Korea. Estimates of production in China are largely guesswork, but the Imperial Institute, adopting the view that the output in China is not likely to be much inferior to the Indian crop and may exceed it, concludes that 40 per cent., or a little less, would be a fair allowance for India's proportion of the world's annual production of rice.

No less important is the position which India occupies in the world's rice trade as a source of supply for other countries. That is not a necessary consequence of its importance as a rice producer. Some of the countries of largest production—China, Japan, Netherlands East Indies—do not grow enough to supply their own needs, though in the case of Japan the large increase in the rice crops in the last three years has changed a heavy import balance into an export balance, so far as the trade with foreign countries (*i.e.* excluding Korea and Formosa) is concerned.

The world's export trade in rice is practically under the control of three countries—India, French Indo-China, and Siam. It has been calculated that the quantity of rice which entered into international trade, as shown by the export returns of different countries, amounted in 1913 to about 6,400,000 tons. This includes exports from European countries of rice which has been milled in those countries, which came originally from India, Siam, or Indo-China, and which unduly swells the total by being counted twice over. Even so, the original exports of rice from India amounted to 40 per cent. of the total, while those from Indo-China were 20 per cent., and those from Siam 18 per cent.; in other words, these three countries provided nearly four-fifths of the total.

India's export trade in rice is really dependent on Burma. Not only does Burma provide about three-fourths of the exports of rice from India as a whole (1,835,000 tons out of 2,420,000 tons in 1913-14), but Burma usually sends to other provinces of India more rice than those other provinces export. Without Burma, India would not be self-supporting in rice. As it is, India's exports of rice in the year before the war were equal to the gross requirements of the rest of the Empire, though actually only 42.6 per cent. of the exports went to British countries, and 57.4 per cent. to foreign countries.

The exports direct to the United Kingdom were only between 6 and 7 per cent. of the total. On the other hand, the United Kingdom imported considerable quantities of rice from Holland and Germany which had been first exported from India to those countries, and after being milled and polished there had been re-exported to the United Kingdom.

Ricemilling, at one time a flourishing industry in the United Kingdom, had declined before the war owing to severe competition from the Dutch and German mills, with the result that not only was the British home market partly supplied by foreign-milled rice, but what was at one time the considerable British export trade in fully-milled rice had been reduced in many directions. Since the war both the home and export trade in milled rice have been largely recovered by the British ricemillers, and it is hoped that this industry and trade may be retained after the war. The possibilities of the development of the complete milling of rice in India before export are also a matter for consideration.

The second part of the article deals with the uses of rice both as an article of food and for industrial purposes; the value of rice meal as a feeding stuff for livestock is also discussed. The milling processes are described, and the different grades of rice and the by-products which are obtained are shown in diagrammatic form. Numerous composition tables are given, and comparisons are afforded in this respect between rice and its by-products and other foodstuffs.

In connection with this subject, it may be pointed out that the Indian Committee of the Imperial Institute is now conducting, at the request of the Secretary of State for India, an inquiry into the possibility of increasing the use of Indian raw materials and foodstuffs within the Empire. The inquiry naturally involves an investigation of the extent to which other countries, and especially enemy countries before the war, had secured a predominant share in Indian trade, and the causes which led to this condition.

A Special Committee has investigated the trade in rice, and it is understood has now almost completed its work. The need for such an inquiry is clear from the facts mentioned above regarding the dominant position taken in the rice trade by Germany and Holland, before the war, as compared with the United Kingdom.

Botany.

ALGAROBIA, CAROB, OR LOCUST BEANS.

A considerable amount of interest has been aroused recently in regard to the trees which produce these beans. A number of letters from correspondents, and articles appearing in print, show conflicting ideas and a general want of accurate knowledge as to what the trees really are. In order to remove all doubt on the subject, the Director of the Horticulture Division wrote to the Director of Kew Gardens, asking for information. Below is a verbatim copy of the reply:—

“Algaroba,” “Carob,” “Locust,” and “St. John’s Bread” are common names, all of which are applied to *Ceratonia siliqua*, a tree 15 ft. to 20 ft. high; native of Southern Europe and the Mediterranean region. It is wild and cultivated in North Africa; naturalised in certain parts of India; cultivated in the West Indies, &c. The beans are sold in England as “locusts,” and they are an important food for stock.

“Algaroba” is also applied to *Prosopis juliflora* DC., a tree up to 50 ft. in height; native of the West Indies and Central America. It is also known as “honey-locust,” “honey-pod,” “Mesquit bean,” and “cashaw.” The pods are a good food for cattle, horses, and pigs, though death has resulted on occasion after eating damp or undried pods, owing, it has been suggested, to the germination or swelling of the seed in the stomach. They are also an important article of food with the Indians and Mexicans, who grind them into flour for baking purposes.

Parkia biglobosa Benth. and *Parkia filicoides* Benth. are known in West Africa as “locust-bean”; they are both trees, the pods of which are edible.

Gleditschia triacanthos Linn., of the Eastern United States, is known as “honey-locust”; *Robinia pseudacacia* Linn., of the Eastern United States, as “locust-tree”; and *Hymenaea Courbaril* Linn. as “West Indian locust”; but the pods of these trees are not regarded as being edible.

Enterolobium Saman Prain (*Pithecolobium Saman* Benth.), the “guano” or “rain-tree,” a large tree native of tropical America, is grown for the sake of the pods as good fodder for stock in the West Indies, India, &c.—“Journal of Agriculture” of New Zealand.

DESTROYING COCKROACHES.

The West India “Committee Circular” of June, 1917, reproduces useful methods for the destruction of cockroaches recommended by the “Lancet.” For actual, quick destruction, stoving with bromine or sulphur dioxide is apparently best; but for domestic application powdered sodium fluoride, which has the effect of effectually driving away the cockroach, and which at the same time keeps indefinitely, is recommended.

Entomology.

CANE GRUB INVESTIGATION.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report on Cane Grub Investigation from Dr. J. F. Illingworth and Mr. E. Jarvis, Entomologists to the Bureau:—

The primary emergence of greyback beetles took place earlier than usual this season, about the end of October, and specimens placed in the insectary on 9th November deposited eggs from which grubs hatched out during the first week in December.

Another emergence of this beetle occurred about 3rd December, and, owing to the prolonged showery weather, egg-laden female specimens are still much in evidence (14th December).

Unless we have a considerable emergence later on, this year's flight will be far below the average. Though emergence has been spread over a period longer than usual, comparatively few beetles have been on the trees at any one time.

EMERGENCE OF *LEPIDIOTA FRENCHI* AND *ROTHI*.

In the region immediately around Meringa, both *frenchi* and *rothi* are much more in evidence than the regular cane beetle, *L. albohirta*. These two smaller species began to emerge about the 1st December, and (14th December) they are still abundant on the feeding trees and low shrubs, fences, grass, &c., where they are mating. These beetles emerge earlier in the evening than the greybacks, and they are easier to collect, because they mate on lower objects and can easily be picked off by hand. Often half a dozen pairs are clustered near together, so that they can all be taken in one hand.

Although the usual biennial occurrence of *frenchi* does not take place until next year, small local emergences are generally noticed each season. At present the grubs of *frenchi* are nearly full grown, and doing great damage in places to both ratoon and young plant cane in the region about Gordonvale. This damage results in a peculiar spotted appearance of the field, for here and there, a chain or so in extent, the cane is yellow and often dead, while the surrounding cane is dark-green and thrifty. In one field of plant cane at Meringa, fully one-third of the crop is damaged in this way. The land had not been in cane for some time, and was covered with a heavy growth of burr and grass. The soil was thoroughly worked previous to planting cane; and though many small grubs were noticed, when ploughing, last May, no attention was given to destroying them. These grubs were evidently the younger stages of *frenchi*, which now in their third stage are able to do such serious damage to the roots.

By giving attention to the advice tendered by this office in the monthly report for last May ("Australian Sugar Journal," IX., p. 221), growers will probably be relieved of considerable future damage from these pests.

On 5th November several specimens of *Anomala australasiæ*, a small dark-green rutellid beetle, were confined in cages at the insectary, and when examined a week later a number of eggs were found that hatched on the 22nd of the same month. We intend working out the life history of this insect, and of other species affecting cane not hitherto recorded.

PARASITISM.

With reference to investigations now in progress regarding certain indigenous parasites of root-eating cane beetles, it may be mentioned that male wasps of *Campsomeris radula* are now emerging from pupæ derived from eggs laid by this species on grubs of *Lepidiota frenchi* at our insectary.

It is interesting to note that the male sex of *C. radula* resembles in general appearance that of the better known digger-wasp, *Dielis formosus*, with which, apparently, it has often been confused by entomologists.

The latter species was described by Tryon in 1902 in an able and instructive treatise entitled "A Parasite of Sugar Cane Beetle Grubs" ("Queensland Agricultural Journal," X., No. 2).

So remarkable, indeed, is the similarity in form and colouration of the adult males of *formosus* and *radula* that specific are confined principally to the presence of a few additional yellow markings on the latter species that are barely visible to the naked eye.

LIGHT TRAPS.

It is our desire in present experiments with light traps, to so simplify them that they may come into common use in canegrowing regions.

A very successful type is simply a large pan, about a yard square, with sides about 4 in. high, the light being furnished by an ordinary acetylene lamp. A sheet of glass, 9 in. by 2 ft., attached to the stem of the lamp with a string, is found to give excellent results in heading off the beetles which circle about the flame, landing them in the tray of kerosene-coated water.

It is found best to have the pan placed on the ground, for if elevated the circling beetles often land beneath it, and in many cases never find their way into the trap.

It is interesting to learn that, though the light appears to have little attraction for the greybacks or the *frenchi* beetles after they have reached their feeding trees, *L. rothi* continues to enter the trap throughout the night. This latter species, though usually rather uncommon, is very abundant this season at Meringa, breeding in an old abandoned field of volunteer cane. These beetles begin dropping from the feeding trees about 9 p.m., and from that time there is a continuous hum as they come to the lamps.

From what is said above, it is evident that the time to catch both the greybacks and *frenchi* in light traps is just at dark in the region of infestation, before the beetles reach the feeding trees. Few results are obtained by exposing the lights for more than an hour. The value of this treatment is, however, in that the female beetles are destroyed before they can lay their eggs.

WHEN THE CLOCK STOPS.

Referring to a suggestion published in the issue of this journal for August, 1917, as to what to do when a clock persists in stopping, Mr. R. B. Stephens, Mellum Mountain, Landsborough, has kindly sent us the following method of proceeding when no professional horologist is available. Many of our country readers will doubtless be glad of the information:—

I notice in the August number of your valuable journal a paragraph on "When the Clock Stops." Knowing how inconvenient it is in the bush to have one's clock troubled with the stops, I would like to give my way of keeping them going. First of all, procure a bottle of 3 in 1 oil, a piece of thin wire (the same that is used for wiring down beer-bottle corks), a pair of pliers, a small screwdriver, and an egg-cup. These constitute all the necessary tools that are required to make a first-class bush clock cleaner.

Now take hold of your clock, examine it carefully for ten minutes, and you should then see how the works are kept in position. If your clock is of the usual twenty-four-hour American, round type, the works will either be held in by the legs upon which it stands, or by several small screws. Remove these, and you can then draw out the whole of the internal works.

If your clock is of the pendulum type, remove the pendulum, and also carefully remove the face and hands, being careful to notice how and in what position the hands are placed so as to replace them in exactly the same way. Now take out the screws that hold the works to the case, and lift them out. Turn your egg-cup upside down; pour on to it a few drops of the oil, and with a piece of the wire, about 4 in. long, lift a small bead or drop of oil on the end of the wire by lifting the wire from the oil in a horizontal position. Then, having taken the works in the hand, deposit a bead of oil on every place where the spindle ends go through, or into the brass frame; also touch lightly with oil the escapement (the part that causes the tick). Now, replace everything as you first found them, after first winding the clock, and in ninety-nine cases out of a hundred your clock will cause you no further trouble for quite a long time. When it does then repeat the dose. With a pendulum clock, after it has been returned to its shelf, listen if it ticks regularly. If not, lift first one side or the other till this is accomplished, and pack it up to that with strips of cardboard or a book, and your clock should then go for years. But *be sure* that it ticks *regularly*. One of my clocks, which cost, new, 15s., has been going for twenty-six years under the above treatment, and will probably be going long after I have stopped. There is a book under one side of it about $\frac{3}{4}$ in. thick, and it keeps going year in and year out. The above will be found to give entire satisfaction if carefully done, and I am sure will be almost as easy as the kerosene method.

General Notes.

AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES IN QUEENSLAND.

SHOW DATES FOR 1918.

Allora.—Central Downs Agricultural and Horticultural Association. Show dates: 20th and 21st February, 1918. J. C. Marshall, secretary.

Atherton.—Atherton Agricultural, Pastoral, and Industrial Society. W. C. Abbott, secretary.

Beaudesert.—Logan and Albert Agricultural and Pastoral Society. A. Winship, secretary.

Beenleigh.—Agricultural and Pastoral Society of South Queensland. Show dates: 19th and 20th September, 1918. R. Newburn, secretary.

Biggenden.—Biggenden Agricultural and Pastoral Society. Show dates: 27th and 28th June, 1918. C. J. Stephensen, secretary.

Boonah.—Fassifern Agricultural and Pastoral Association. Show dates: 15th and 16th May, 1918. G. E. Bell, secretary.

Belmont.—Belmont Agricultural, Horticultural, and Industrial Society. Show date: 24th August, 1918. J. A. Walker, secretary.

Brisbane.—National Agricultural and Industrial Association. Show dates: 12th to 17th August, 1918. J. Bain, secretary.

Bundaberg.—Bundaberg Agricultural, Pastoral, and Industrial Society. Show dates: 29th to 31st May, 1918. Redmond Bros., secretaries.

Caboolture.—Caboolture Pastoral, Agricultural, and Industrial Society. A. Toms, secretary.

Cairns.—Cairns Agricultural, Pastoral, and Mining Association. Nevitt and Boden, secretaries.

Caves, *viâ* Rockhampton.—Central Barmoyea Farmers' Progress Association. B. P. F. Smith, secretary.

Charleville.—Central Warrego Pastoral and Agricultural Association. A. Cahill, secretary.

Childers.—Childers Pastoral, Agricultural, and Industrial Society. W. J. Thompson, secretary.

Chinchilla.—Chinchilla Agricultural and Pastoral Association. Show dates: 9th and 10th April, 1918. W. L. Archer, secretary.

Clifton.—Darling Downs Pastoral, Agricultural, and Industrial Association. Show dates: 20th and 21st March, 1918. P. G. A. Murphy, secretary.

Crow's Nest.—Crow's Nest Agricultural, Horticultural, and Industrial Society. Show dates: 2nd and 3rd April, 1918. W. B. Carlile, secretary.

Emerald.—Emerald Pastoral and Agricultural Society. Show dates: 30th and 31st May, 1918. J. Esmond, secretary.

Esk.—Toogoolawah Pastoral, Agricultural, and Industrial Association. Show dates: 1st and 2nd May, 1918, at Toogoolawah. T. C. Pryde, secretary.

Gin Gin.—Gin Gin Agricultural, Pastoral, and Industrial Society. Show dates: 5th and 6th June, 1918. C. M. Morris, secretary.

Gladstone.—Port Curtis Agricultural, Pastoral, and Mining Association. Show dates: 4th to 6th June, 1918. J. T. W. Brown, secretary.

Goombungee.—Goombungee Agricultural, Horticultural, and Pastoral Society. Show date: 27th March, 1918. E. J. Moore, secretary.

Goondiwindi.—Macintyre Pastoral and Agricultural Society. Show dates: 23rd and 24th April, 1918. J. A. Hall, secretary.

Gympie.—Gympie Agricultural, Mining, and Pastoral Society. Show dates: 28th and 29th August, 1918. F. W. Shepherd, secretary.

Ipswich.—The Queensland Pastoral and Agricultural Society. Show dates: 22nd and 23rd May, 1918. G. W. Allen, secretary.

Kilcoy.—Kilcoy Pastoral, Agricultural, and Industrial Society. Show dates: 4th and 5th July, 1918. A. R. Hooper, secretary.

Kilkivan.—Kilkivan Pastoral, Agricultural, and Industrial Association. Show dates: 29th and 30th May, 1918. M. O. Aronsten, secretary.

Killarney.—Killarney Agricultural Society. Show dates: 27th and 28th February, 1918. W. D. McGilvray, secretary.

Kingaroy.—Agricultural, Pastoral, and Industrial Society. Show dates: 24th and 25th April, 1918. R. A. Pearse, secretary.

Lockyer.—Lockyer Agricultural and Industrial Society. R. Thomas, secretary.

Longreach.—Longreach Pastoral and Agricultural Society. J. Forrest, secretary.

Lowood.—Lowood and Tarampa Pastoral and Agricultural Association. Show dates: 7th and 8th May, 1918. W. E. Michel, secretary.

Marburg.—Marburg and District Agricultural and Industrial Association. Show dates: 1st and 3rd June, 1918. F. H. Bielefeld, secretary.

Maryborough.—Wide Bay and Burnett Pastoral and Agricultural Society. Show dates: 11th to 13th June, 1918. H. A. Jones, secretary.

Nambour.—Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society. Show dates: 24th and 25th July, 1918. J. J. Wilkinson, secretary.

Nanango.—Nanango Agricultural, Pastoral, and Mining Society. Show dates: 6th and 7th March, 1918. S. Cavaye, secretary.

North Pine.—The Pine Rivers Agricultural, Horticultural, and Industrial Association. Show dates: 21st and 22nd June, 1918. G. Armstrong, secretary.

Pittsworth.—Pittsworth Pastoral, Agricultural, and Horticultural Association. Show date: 23rd January, 1918. L. G. Sims, secretary.

Pomona.—Noosa Agricultural, Horticultural, and Industrial Society. Show dates: 15th and 16th May, 1918. H. Robinson, secretary.

Rockhampton.—Rockhampton Agricultural Society. Show dates: 20th to 22nd June, 1918. H. Hill, secretary.

Roma.—Western Pastoral and Agricultural Association of Queensland. F. W. Mills, secretary.

Rosewood.—Rosewood Agricultural and Horticultural Association. Show dates: 24th and 25th July, 1918. A. J. Loveday, secretary.

Southport Agricultural, Horticultural, and Industrial Society. S. H. Earle, secretary.

Stanthorpe.—Stanthorpe Agricultural Society. Show dates: 7th and 8th February, 1918. A. E. Bateman, secretary.

Toowoomba.—Royal Agricultural Society of Queensland. Show dates: 16th to 18th April, 1918. G. Noble, secretary.

Toombul Agricultural, Horticultural, and Industrial Association. F. Shaw, secretary.

Warwick.—Eastern Downs Horticultural and Agricultural Association. Show dates: 12th to 14th February, 1918. H. Sterne, secretary.

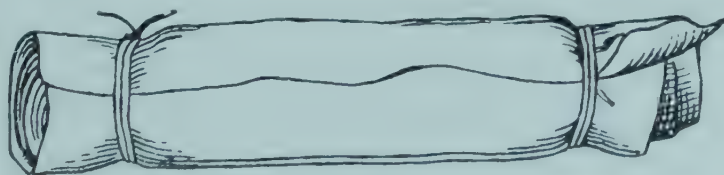
Wondai.—Wondai Agricultural, Pastoral, and Industrial Society. Show dates: 22nd and 23rd May, 1918. H. J. Compagnoni, secretary.

Woodford.—Woodford Agricultural, Pastoral, and Industrial Society. Show dates: 18th and 19th July, 1918. G. H. Csmond, secretary.

Zillmere.—Zillmere Agricultural, Horticultural, and Industrial Society. Show date: 21st September, 1918. A. B. Marquis, secretary.

TO CLEAN RUSTED HORSE-SHOE NAILS.

During the rainy season in the tropics, horse-shoe nails, even though covered, frequently get so rusty as to be quite unusable. Mr. J. F. Keane, Mareeba, says:—“To clean them, take a few (twenty-four is a convenient number) and pack them heads to point in equal numbers on a strip of canvas or sacking long enough to wrap about three times round them. Roll them up tightly, and tie two strings, also tightly,

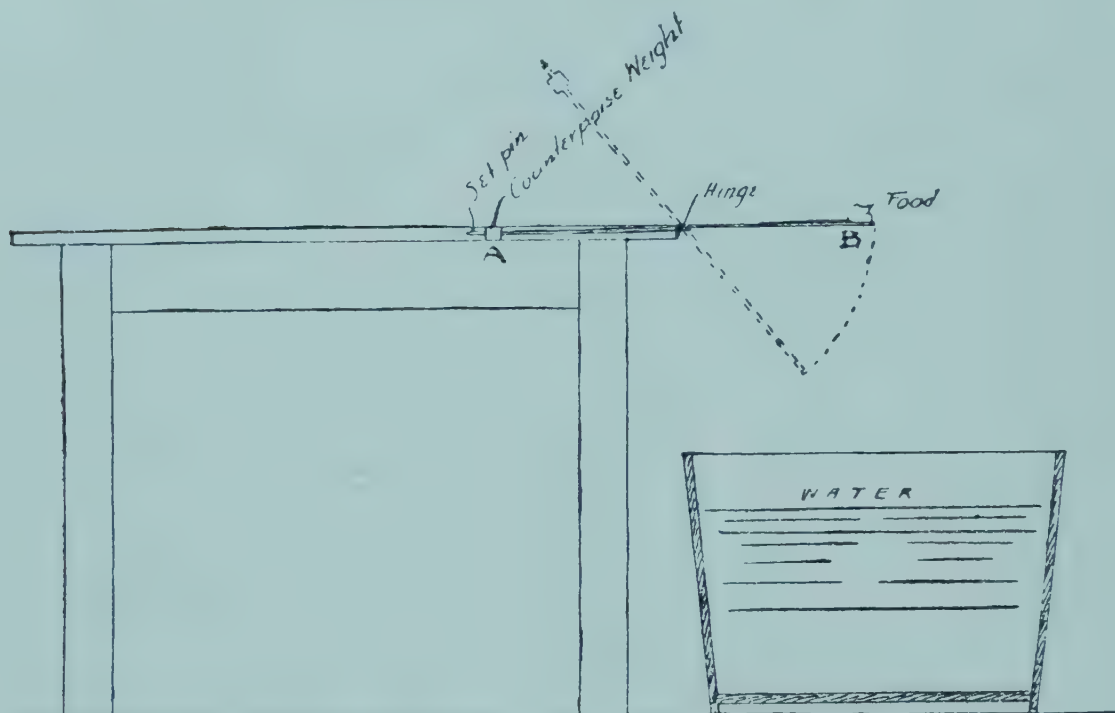


round the parcel, close to the heads of the nails, as shown in the illustration, which is half natural size. Roll the parcel backwards and forwards between the palms for three or four minutes. Then cut the string, blow the rust or dust off the nails, and they will be found as bright as new pins, ready for use.

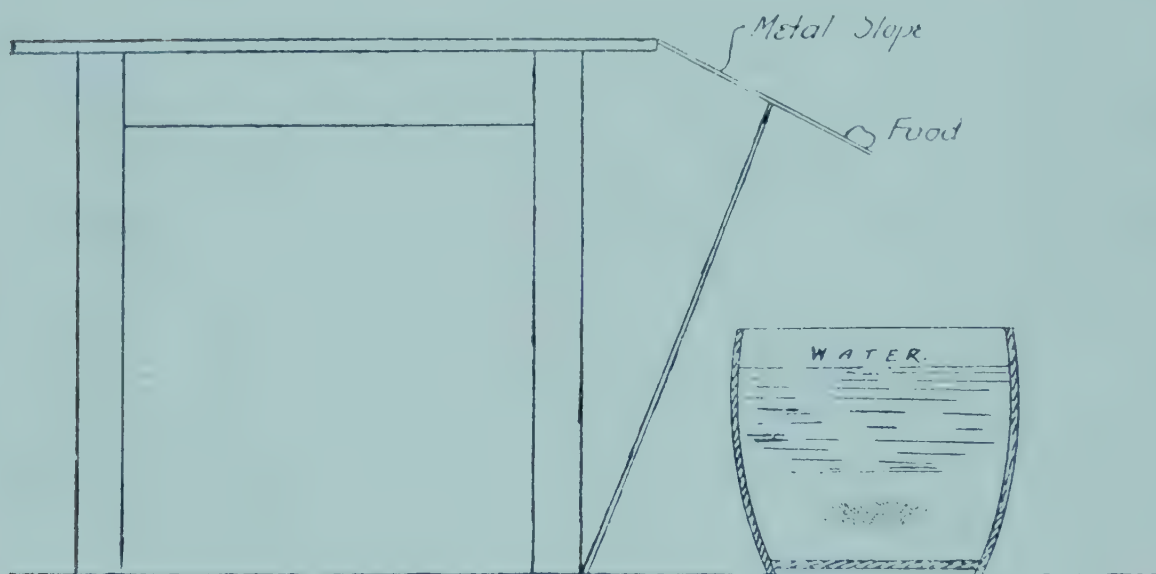
“Rusty needles may also be burnished in this way, if there are enough to make a roller, using a piece of strong, light rag.”

NOTES ON SIMPLE RAT TRAPS.

The "Journal of the Board of Trade," England, devotes several pages to a description of various devices for entrapping the wary rat, two of which we select as likely to be of use to readers who are troubled with rats in the house. No. 1 is the Table or Shelf Trap, No. 2 the Table Slope Trap, here illustrated.



No. 1.—The Table or Shelf Trap.



No. 2.—The Table Slope Trap.

Answers to Correspondents.

THE BRITISH ARMY.

IGNORAMUS—

There are many who put to us the questions as to the constitution of the British Army. This information can be obtained correctly by an application to headquarters. So far, however, as we can help you to an idea of the numbers constituting regiments, battalions, brigades, army corps, divisions, &c., take the following:—

“The unit of cavalry is a regiment, and of infantry a battalion. Each British cavalry regiment in war consists of about 553 officers and men, each regiment containing three squadrons of 164 men (besides the machine-gun section, ambulance, &c.). Three cavalry regiments make a cavalry brigade (about 1,700 officers and men), and four cavalry brigades make a cavalry division, which, including four batteries of horse artillery (24 guns) and other troops attached to it, numbers about 10,000 officers and men. An infantry battalion numbers about 1,020 all told. Four battalions go to an infantry brigade (about 4,150). A division (of infantry) consists of three infantry brigades (about 12,400), with 70 guns, engineers, ambulances—in all, amounting to just under 20,000 men. Two divisions make an army corps (40,000). Any number of army corps—but usually from two to five or six—may be clubbed together as an army. An army corps (which was a unit invented by Napoleon) is in most countries increased from 40,000 to nearer 50,000 when all the reserves have had time to join.”

COTTON BONUS.

COTTON-GROWER—

No. The Commonwealth bonus of 10 per cent. on cotton produced in Queensland was only in force from 1st July, 1907, to 13th June, 1916, when it lapsed. It affected the grower in that the purchaser of the seed cotton, who ginned it, by obtaining the bonus, was enabled to give the grower a higher price for his product delivered at the ginnery. The Department of Agriculture and Stock for the coming season and two subsequent seasons will make an advance to cotton-growers of 2d. per lb. on all good, clean cotton delivered at the Department's ginnery, William street. Any profit accruing after the cotton has been ginned and sold will be divided amongst suppliers according to the quantity sent in to be dealt with.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR JANUARY, 1918.

Article.								JANUARY.	
								Prices.	
Bacon	...	...	...	...	...	...	lb.	9½d. to 10d.	
Barley	...	...	...	...	...	...	bush.	2s. 6d. to 3s.	
Bran	...	...	...	...	...	...	ton	£5 15s.	
Broom Millet	...	...	...	...	...	...	"	£30 to £50	
Butter	...	...	...	...	...	...	cwt.	149s. 4d.	
Chaff, Mixed	...	...	...	...	...	...	ton	£3 10s. to £4	
Chaff, Oaten	...	...	...	...	...	...	"	£6 10s.	
Chaff, Lucerne	...	...	...	...	...	...	"	£3 to £5	
Chaff, Wheaten	...	...	...	...	...	...	"	£4 5s. to £4 15s.	
Cheese	...	...	...	...	...	...	lb.	9½d. to 10d.	
Flour	...	...	...	...	...	...	ton	£12	
Hams	...	...	...	...	...	...	lb.	1s. 3d. to 1s. 10d.	
Hay, Oaten	...	...	...	...	...	...	ton	£7 10s.	
Hay, Lucerne	...	...	...	...	...	...	"	£2 5s. to £2 15s.	
Hay, Wheaten	...	...	...	...	...	...	"	£4 5s.	
Honey	...	...	...	...	...	...	lb.	2½d. to 3d.	
Maize	...	...	...	...	...	...	bush.	4s. 6d. to 5s.	
Oats	...	...	...	...	...	...	"	1s. 6d. to 2s. 6d.	
Onions	...	...	...	...	...	...	ton	£8 to £10	
Peanuts	...	...	...	...	...	...	lb.	4d. to 6d.	
Pollard	...	...	...	...	...	...	ton	£6 12s. 6d. to £7	
Potatoes	...	...	...	...	...	...	"	£2 10s. to £7 5s.	
Potatoes (Sweet)	...	...	...	...	...	...	sug. bag	1s. 9d. to 2s.	
Pumpkins (Cattle)	...	...	...	...	...	...	ton	£2 10s. to £6	
Eggs	...	...	...	...	...	...	doz.	9d. to 1s. 2d.	
Fowls	...	...	...	...	...	...	per pair	4s. to 5s.	
Ducks, English	...	...	...	...	...	...	"	4s. 6d. to 5s.	
Ducks, Muscovy	...	...	...	...	...	...	"	7s. to 8s. 6d.	
Geese	...	...	...	...	...	...	"	10s. to 11s.	
Turkeys (Hens)	...	...	...	...	...	...	"	12s. to 14s.	
Turkeys (Gobblers)	...	...	...	...	...	...	"	18s. to 26s.	
Wheat	...	...	...	...	...	...	bush.	4s. 2d. to 4s. 3d.	

VEGETABLES—TURBOT STREET MARKETS.

Asparagus, per dozen bundles	...	...	...	...	...	...	6s. to 12s.
Cabbages, per sack	...	...	...	...	...	...	2s. 6d. to 6s.
Cauliflowers, per dozen	...	...	...	...	...	...	...
Chocos, per dozen	...	...	...	...	...	...	1s. 6d. to 2s.
Beans, per sugar bag	...	...	...	...	...	...	3s. 6d. to 6s.
Peas, per sugar bag	...	...	...	...	...	...	4s. to 7s.
Carrots, per dozen bunches	...	...	...	...	...	...	4d. to 1s.
Beetroot, per dozen bunches	...	...	...	...	...	...	6d. to 9d.
Lettuce, per dozen	...	...	...	...	...	...	1s. to 1s. 6d.
Parsnips, per dozen bundles	...	...	...	...	...	...	6d. to 1s.
Sweet Potatoes, per sugar bag	...	...	...	...	...	...	1s. 6d. to 2s.
Table Pumpkins, per dozen	...	...	...	...	...	...	1s. to 2s. 6d.
Marrows, per dozen	...	...	...	...	...	...	6d. to 1s. 6d.
Tomatoes, per case	...	...	...	...	...	...	2s. 6d. to 4s.
Cucumbers, per dozen	...	...	...	...	...	...	1s. to 1s. 6d.

SOUTHERN FRUIT MARKETS.

Article.	JANUARY.				
	Prices.				
Bananas (Queensland), per crate ...	...	...	...	...	9s. to 12s.
Bananas (Tweed River), per crate ...	...	...	...	...	4s. to 6s.
Bananas (Fiji), per bunch...	...	...	...	...	5s. to 6s. 6d.
Bananas (G.M.), per crate ...	...	...	...	...	18s. to 21s.
Mangoes, per case ...	...	...	...	...	4s. to 5s.
Oranges (Navel), per case ...	...	...	...	...	10s. to 14s.
Oranges (Seville), per bushel case ...	...	...	...	...	...
Oranges (other), per case ...	...	...	...	...	7s. to 10s.
Papaw Apples, per half-bushel case ...	...	...	...	...	6s. to 7s.
Passion Fruit, per half case ...	...	...	...	...	4s. to 7s.
Pineapples (Queens), per double case ...	...	...	...	...	10s. to 14s.
Pineapples (Ripleys), per double case ...	...	...	...	...	7s. to 9s.
Pineapples (Common), per double case ...	...	...	...	...	7s. to 9s.
Tomatoes (Queensland), per half-bushel case ...	...	...	...	...	1s. 6d. to 3s.
Cucumbers, per bushel case ...	...	...	...	...	6s. to 8s.
Strawberries, per lb. ...	...	...	...	...	...

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	JANUARY.				
	Prices.				
Apples, Eating, per bushel case ...	...	...	...	...	15s. to 22s.
Apples, Cooking, per bushel case ...	...	...	...	...	3s. to 5s. 6d.
Apricots, per case ...	...	...	...	...	4s. to 6s.
Bananas (Cavendish), per dozen ...	...	...	...	...	1½d. to 4½d.
Bananas (Sugar), per dozen ...	...	...	...	...	4d. to 4½d.
Cape Gooseberries, per quart ...	...	...	...	...	9d.
Cherries, per box ...	...	...	...	...	7s. to 11s.
Citrons, per hundredweight ...	...	...	...	...	10s.
Cocanuts, per sack ...	...	...	...	...	12s. to 15s.
Cumquats, per quarter-case ...	...	...	...	...	...
Grapes, per lb. ...	...	...	...	...	1½d. to 4d.
Lemons (Lisbon), per case ...	...	...	...	...	6s. to 8s.
Mandarins, per case ...	...	...	...	...	10s. to 15s.
Mangoes, per case ...	...	...	...	...	3s. to 6s.
Oranges (Navel), per case ...	...	...	...	...	17s. 6d.
Oranges (Seville), per hundredweight ...	...	...	...	...	3s. 6d. to 10s.
Oranges (other), per case ...	...	...	...	...	6s. to 12s.
Papaw Apples, per quarter-case ...	...	...	...	...	1s. to 1s. 6d.
Passion Fruit, per quarter-case ...	...	...	...	...	2s. to 3s.
Peaches, per quarter-case ...	...	...	...	...	3s. to 6s. 6d.
Pears, per quarter-case ...	...	...	...	...	12s. 6d. to 18s. 6d.
Peanuts, per lb. ...	...	...	...	...	4d. to 6d.
Pineapples (Ripleys), per dozen ...	...	...	...	...	6s. 6d. to 7s. 6d.
Pineapples (Rough), per dozen ...	...	...	...	...	2s. to 5s.
Pineapples (Smooth), per dozen ...	...	...	...	...	3s. to 5s.
Plums, per half-bushel case ...	...	...	...	...	4s. to 5s. 6d.
Plums, per quarter case ...	...	...	...	...	2s. to 3s.
Rockmelons, per dozen ...	...	...	...	...	1s. to 2s.
Strawberries, per dozen boxes ...	...	...	...	...	2s. to 3s. 6d.
Tomatoes, per case ...	...	...	...	...	3s. to 5s. 6d.
Watermelons, per dozen ...	...	...	...	...	2s. to 7s.

TOP PRICES, ENOGGERA YARDS, DECEMBER, 1917.

Animal.	DECEMBER.	
	Prices.	
Bullocks	£24 5s. to £28 2s. 6d.	
Cows	£16 12s. 6d. to £20 2s. 6d.	
Cows (Single)	...	
Merino Wethers	46s. 6d.	
Crossbred Wethers	50s.	
Merino Ewes	30s.	
Crossbred Ewes	44s. 9d.	
Lambs	37s. 3d.	
Pigs (Backfatters)	£5	
Pigs (Baconers)	69s.	
Pigs (Porkers)	58s.	
Pigs (Slips)	13s. 6d.	

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF DECEMBER 1917, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING DECEMBER, 1917 AND 1916, FOR COMPARISON.

AVERAGE RAINFALL.			TOTAL RAINFALL.		AVERAGE RAINFALL.			TOTAL RAINFALL.	
Divisions and Stations.			Divisions and Stations.		Divisions and Stations.			Divisions and Stations.	
Dec.	No. of Years' Records.		Dec., 1917.	Dec., 1916.	Dec.	No. of Years' Records.		Dec., 1917.	Dec., 1916.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Atherton	7.10	15	9.81	17.74	Nambour	6.03	20	7.74	13.80
Cairns	8.99	34	13.14	25.14	Nanango	3.64	24	4.54	3.39
Cardwell	8.14	44	12.27	24.15	Rockhampton	4.33	29	3.09	9.44
Cooktown	6.67	40	21.68	16.63	Woodford	5.25	29	5.56	11.02
Herberton	5.35	29	7.39	13.81					
Ingham	6.28	24	18.26	24.98	<i>Darling Downs.</i>				
Innisfail	11.91	35	25.33	29.99	Dalby	3.14	46	4.07	1.64
Mossman	16.20	5	15.37	26.43	Emu Vale	3.49	20	5.05	2.51
Townsville	5.44	45	11.03	17.99	Jimbour	3.22	28	3.26	1.04
<i>Central Coast.</i>					Miles	2.57	31	1.96	2.07
Ayr	3.56	29	8.22	8.31	Stanthorpe	3.45	43	5.99	2.59
Bowen	4.13	45	16.05	11.04	Toowoomba	4.19	44	6.10	3.72
Charters Towers	3.50	34	3.09	10.69	Warwick	3.46	29	4.95	2.26
Mackay	6.76	45	13.19	17.56					
Proserpine	7.79	13	19.30	24.54	<i>Maranoa.</i>				
St. Lawrence	4.28	45	8.32	8.45	Roma	2.32	42	2.34	3.38
<i>South Coast.</i>									
Biggenden	4.74	17	3.28	2.66	<i>State Farms, &c.</i>				
Bundaberg	4.45	33	3.02	6.63	Bungeworgorai	2.83	5	3.10	5.69
Brisbane	5.02	66	5.19	5.10	Gatton College	3.32	17	7.14	2.63
Childers	5.23	21	2.64	6.29	Gindie	2.58	17	2.23	9.82
Crohamhurst	6.57	23	7.38	12.33	Hermitage	2.64	10	4.38	2.82
Esk	4.35	29	6.17	2.93	Kairi	9.79	5	10.55	18.89
Gayndah	3.86	45	2.91	3.38	Kamerunga	6.30	26	13.91	23.58
Gympie	5.89	46	6.91	5.31	Sugar Experiment Station, Mackay	7.99	...	13.04	24.44
Glasshouse M'tains	6.64	8	...	14.24	Warren	4.34	5	3.28	7.93
Kilkivan	4.28	37	4.39	3.98					
Maryborough	4.49	45	5.21	5.59					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for December, 1917, and for the same period of 1916, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Officer.

Farm and Garden Notes for March.

FIELD.—Take every opportunity of turning up the ground in readiness for sowing and planting winter crops. The main crop of potatoes should at once be planted. As the growth of weeds will now be slackening off, lucerne may be sown on deeply cultivated soil. The latter should be rich and friable, with a porous subsoil. The land should be thoroughly pulverised. Do not waste time and money in trying to grow lucerne on land with a stiff clay subsoil. Prepare the land a couple of months before sowing, care being taken to cross plough and harrow before the weeds have gone to seed. This ensures a clean field. Sow either broadcast or in drills. In the former case, 20 lb. of seed will be required; in the latter, 10 lb. A good stand of lucerne has been obtained with less quantities. Should weeds make their appearance before the plants have sent down their tap roots, mow the field. Before they can again make headway enough to do any damage, the lucerne will be strong enough to hold its own against them. Harrow and roll the land after mowing. Gather all ripe corn. It is now too late to sow maize, even 90-Day, with any certainty of harvesting a crop of grain. Rye grass, prairie grass, oats, barley (in some districts, wheat), sorghum, vetches, carrots, mangolds, and Swede turnips may be sown. In Northern Queensland, sow tobacco seed, cowpea, carob beans, sweet potatoes, opium poppy, &c. Sow anatto, jack fruit, and plant kola-nut cuttings. Some temperate-zone vegetables may be planted, such as egg plant, potatoes, &c. Coffee-planting may be continued. Harvest kafir corn and paddy. Cotton picking will now be in full swing. Pick cleanly, and expose to the sun for a few hours before storing or baling. Pick none but fully ripe bolls.

FLOWER GARDEN.—Now is the time to plant out bulbs. A complete garden could be furnished with these charming plants, which are to be had in every colour and variety. Amongst the many are—*Amaryllis*, *anemone*, *arum*, *babiana*, *crinum*, *crocus*, *freesia*, *ranunculus*, *jonquils*, *iris*, *ixias*, *gladiolus*, *narcissus*, *Jacobean*, *lilies*, *tigridia*, *tritonias*.

All bulbs like well-drained, somewhat sandy soil, with a plentiful admixture of leaf mould. Herbaceous plants and annuals which it is intended to raise from seed should be sown this month. Such are *antirrhinums* (snapdragon), *asters*, *cornflowers*, *dianthus*, *larkspurs*, *daisies*, *cosmea*, *candytuft*, *lupins*, *gaillardias*, *godetia*, *mignonette*, *poppies*, *pansies*, *phlox*, *sweet peas*. Cannas now planted will require plenty of food in the shape of liquid manure. Put in cuttings of *carnations*. *Chrysanthemums* require attention in the way of disbudding, staking, watering with liquid manure, &c. Growers for exhibition will thin out to a few buds and protect the flowers from rain and sun. *Dahlias* should be looking well. To secure fine blooms, disbudding should be done.

Now, as to climbers which may now be planted. These are—*Allamanda Schottii* (beautiful yellow), *Antigonon leptopus*, a charming cerise-coloured climber; *Aristolochia elegans*, handsome as an orchid, and easily grown; *Aristolochia ornithocephala* (Dutchman's Pipe), very curious, large, always attracts attention; *Asparagus plumosa* grows in any shady place; *Baumontia grandiflora*, splendid white flower, grand for a fence, will grow 50 ft. high; *Bignonias* of several kinds; *Bougainvilleas*, with their splendid leafy pink and purple flowers, rapidly clothe a fence or unsightly shed with a blaze of blossom; *Quisqualis indica*, a fine creeper, flowers pink, changing to white; *Wistaria*, purple and white. Most beautiful is the *Bauhinia scandens*, rarely seen about Brisbane. We grew a plant of this climber at Nundah, and it soon closed in the front of the veranda for a distance of over 80 ft. The leaves are very small, and in the flowering season it presents almost a solid mass of beautiful round bunches of blossoms, something like the hawthorn bloom—pink and white. It seeds freely, but the seeds are difficult to germinate, and when they have produced a plant it is still more difficult to rear it. A rooted sucker from the main stem will in all probability grow.

KITCHEN GARDEN.—During this month a very large variety of vegetable seeds may be sown in readiness for planting out where necessary in the autumn, which begins on the 20th of March. All unoccupied land should be roughly dug, and, where required, add well-decomposed manure. Transplant cabbage, cauliflower, celery, &c. Sow French and Broad beans, beet, carrot, turnips, radish, cabbage, cauliflower, cress, peas, onions, mustard, &c. Former sowings should be thinned out and kept clear of weeds. Mulch round melon and cucumber beds with a good dressing of long stable manure, as it assists in keeping the fruit clean and free from damp. Cucumbers, melons, French beans, and tomatoes should be looked for every day and gathered, whether required or not, for, if left on the vines to perfect their seeds, the plants will soon cease to be productive, or will form inferior, ill-shaped, and hence unsaleable fruit.

Orchard Notes for March.

THE SOUTHERN COAST DISTRICTS.

The marketing of the main crop of pineapples will continue to occupy the attention of growers; and as it is probable that the plantations have been allowed to get somewhat dirty during the previous month, they should be cleaned up as soon as ever the crop has been got off. The fruit of the new crop of citrus fruit will be showing signs of ripening towards the end of the month; and, as the fruit during this period of its growth is very liable to the attack of insect pests of various kinds, it is important that steps should be taken to prevent loss arising from this cause as far as possible.

Large sucking moths of several kinds attack the fruit as soon as it shows signs of ripening; and, as they always select the first fruit that shows signs of colouring, it is a good plan to gather a few forward fruit and to ripen them up quickly by placing them on a barn floor, and covering them up with bags or straw. They will turn colour in a few days, and develop the characteristic scent of the ripening fruit. The fruit so treated should be hung up in conspicuous places in the orchard as trap-fruit, as not only will it attract the moths, but also the fruit-flies. The moths will be found clustered round the trap-fruits in large numbers, and can then be easily caught and destroyed. Fruit-fly will also puncture such fruit; and if the fruit is destroyed before the larvæ reach maturity, a later crop of these insects is prevented from hatching out. Fruit-flies may also be caught in large numbers by means of such artificially ripened fruits. The fruits are smeared with tanglefoot, and hung about the orchard. The fly, attracted by the colour, settles on the fruit, and is caught in a similar manner to house-flies on specially prepared sticky paper. These simple remedies, if carefully carried out, will result in the destruction of large numbers of sucking moths and fruit-flies.

The yellow peach-moth that does such damage to peaches in spring, and that attacks corn, sorghum, cotton bolls, custard apples, and many other plants and fruits, often does a lot of damage to citrus fruits. It acts in a very similar manner to the second and later generations of the codling moth of pomaceous fruits, in that it lays its eggs where two fruits touch, under the shelter of a leaf on the fruit, at the stem end of the fruit, and, in the case of navel oranges, in the navel itself; in fact, anywhere that there is a likelihood of the egg not being disturbed. The egg hatches out into a small spotted caterpillar, which eats its way into the fruit, causing it to ripen prematurely, and fall off. Where two fruits touch, it often eats into and destroys both, and it frequently leaves one fruit to go and destroy a second. It is a very difficult insect to deal with, owing to the number of fruits and plants on which it lives; but, as far as citrus fruits are concerned, the best remedy is undoubtedly to spray the fruit with a remedy that will destroy the young insect when it starts to eat the skin of the fruit. Bordeaux mixture has been found efficacious, but I am of opinion that spraying with Paris green and lime, Kedzie's mixture, or arsenite of lead will also have good results. The latter poison is, in my opinion, well worth giving a thorough test, as it sticks to the fruit and leaves for a long time. Bordeaux mixture, either alone or in conjunction with Paris green or Kedzie's mixture, is, however, a good remedy, as not only will it destroy the larvæ or prevent the moth from attacking the tree, but it is also the best remedy for black brand or melanose, as well as tending to keep all other fungus pests in check. Fight fruit-fly systematically—both by means of the sticky fruit already recommended and by gathering all fly-infested fruit, such as guavas, late mangoes, kumquats, &c., as well as any oranges or mandarins that may have been infested, as if kept in check now there will be little loss throughout the season. A little fruit will be marketed towards the end of the month. See that it is gathered and sweated for seven days before marketing, and don't gather it too immature. Beauty of Glen Retreat mandarins are often gathered and marketed as soon as they show signs of colouring. They are then as sour as a lemon, and anyone who is unlucky enough to buy them will steer off mandarins for some time to come. This variety should not be gathered till thoroughly ripe, as when marketed in an immature state it spoils the market, as it puts people off eating citrus fruit.

Clean up the orchard after the summer rains, and have everything ready for the marketing of the crop. See that there is a good supply of clean, dry case timber on hand, as one of the greatest sources of loss in shipment is packing fruit in green cases.

Strawberry planting can be done throughout the month. Plant such berries as Federation on the lowest ground, and Aurie, Anetta, Trollop's Victoria, and Glenfield Beauty on warm, well-drained soils. Prepare the land thoroughly, so that it is in perfect tilth, and in a fit state to retain moisture well; as on this, as much as anything, the success of the crop depends. Where new orchards are to be planted, get the land ready—not the clearing, which should have been done months ago, but the working of the land, as it is advisable to get it thoroughly sweetened before putting the trees in.

THE TROPICAL COAST DISTRICTS.

The Notes for February apply equally to March. See that bananas are netted—keep down weed growth, and market any sound citrus fruits. Clean up the orchards as well as possible, and keep pines clean. Get land ready where new orchards are to be set out, as tree-planting can be done during April and May. Pines and bananas can still be planted, as they will become well established before winter.

THE SOUTHERN AND CENTRAL TABLELANDS.

Finish the gathering of the later varieties of deciduous fruits, as well as grapes. Clean up the orchard, and get ready for winter. Get new land ready for planting; and where there are old, dead, or useless trees to be removed, dig them out and leave the ground to sweeten, so that when a new tree is planted to replace them the ground will be in good order.

In the drier parts, where citrus trees are grown, keep the land well worked, and water where necessary.

GUNFIRE AND RAINFALL.

There used to exist, and it exists even to the present day, a popular belief that the explosion of guns induces rainfall, and special guns were constructed with the object of bringing down falls of rain during dry seasons. Several experiments to test this theory were made some years ago in Queensland by means of kites and guns, but all resulted in failure.

In an article in the London "Times" of 21st December, 1914, we find the following notes on the subject:—

"An impression has arisen in some quarters that the heavy and persistent rains recently experienced in this country (Great Britain) are attributable to abnormal atmospheric disturbances produced by heavy gun-firing at the seat of war. The idea is by no means novel, and, like other meteorological myths (such, for instance, as the belief in thunderbolts and the supposed influence of the moon upon our weather), it seems to possess a bullet-proof hide and takes any amount of killing. About four years ago the First Lord of the Admiralty was asked in the House of Commons whether he would instruct the Fleet to carry out their heavy gun practice at some period of the year other than in the middle of harvest time, 'when the resultant heavy rain may cause serious loss to the farming community.' A similar suggestion was made at the instance of a member of the Highland and Agricultural Society of Scotland who, at a meeting of that body, moved that 'the Admiralty be petitioned to discontinue heavy gun-fire round the coasts in August and September, when clouds were about' (*sic*), the speaker adding that 'firing was apt to bring down rain, and at that time of the year fine weather was desirable.' It may be said at once that the idea is absolutely without foundation. Experiments made some years ago in America and on the Continent showed that in droughty weather no amount of concussion in the air artificially produced had the slightest effect in the production of rain.

"At the present time there is one fact which should (one scarcely likes to believe that it will) at once dispose of the cherished theory. In spite of occasional displays of unwonted activity, there are no reasons for thinking that gun-firing at the front is more violent than it was in the earlier stages of the war. The spell of unsettled weather should, therefore, have commenced shortly after the outbreak of hostilities. As a matter of fact, nothing of the kind took place. In August and September the rainfall in the south-east of England was, on the contrary, much below the average, and in October there was again a considerable though less marked deficiency.

"As an instance of the unreliability of the notion respecting the effect of detonation upon rainfall, a correspondent of 'Symons's Meteorological Magazine' drew attention some little time ago to the fact that at Shoeburyness, where at certain seasons of the year big guns are being fired almost daily, the average annual rainfall is smaller than in any other part of the United Kingdom."

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE.

1918.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		PHASES OF THE MOON.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	4.57	6.46	5.21	6.41	5.41	6.19	5.58	5.46	The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania. H. M. 5 Jan.) Last Quarter 9 49 p.m. 13 „ ● New Moon 8 36 a.m. 20 „ ☾ First Quarter 12 38 „ 27 „ ○ Full Moon 1 14 p.m. The Moon will be at Perigee on 15th, Apogee on 3rd and 31st. 4 Feb.) Last Quarter 5 52 p.m. 11 „ ● New Moon 8 5 „ 18 „ ☾ First Quarter 10 57 a.m. 26 „ ○ Full Moon 7 35 p.m. The Moon will be at Perigee on 12th, Apogee on 28th. 6 Mar.) Last Quarter 10 44 a.m. 13 „ ● New Moon 5 52 p.m. 19 „ ☾ First Quarter 11 30 „ 28 „ ○ Full Moon 1 33 „ The Moon will be at Perigee on 13th, Apogee on 27th. 4 April) Last Quarter 11 33 p.m. 11 „ ● New Moon 2 34 „ 18 „ ☾ First Quarter 2 8 „ 26 „ ○ Full Moon 6 5 „ The Moon will be at Perigee on 10th, Apogee on 23rd.
2	4.58	6.46	5.22	6.41	5.41	6.18	5.59	5.45	
3	4.59	6.46	5.23	6.40	5.42	6.17	5.59	5.44	
4	4.59	6.46	5.24	6.40	5.43	6.16	6.0	5.43	
5	5.0	6.46	5.25	6.39	5.44	6.15	6.0	5.42	
6	5.1	6.47	5.25	6.39	5.45	6.14	6.1	5.41	
7	5.2	6.47	5.26	6.38	5.45	6.13	6.1	5.39	
8	5.3	6.47	5.27	6.37	5.46	6.12	6.2	5.38	
9	5.3	6.47	5.28	6.36	5.46	6.11	6.2	5.37	
10	5.4	6.48	5.29	6.35	5.47	6.10	6.3	5.36	
11	5.5	6.48	5.29	6.35	5.47	6.9	6.3	5.35	The Moon will be at Perigee on 12th, Apogee on 28th. 4 Feb.) Last Quarter 5 52 p.m. 11 „ ● New Moon 8 5 „ 18 „ ☾ First Quarter 10 57 a.m. 26 „ ○ Full Moon 7 35 p.m. The Moon will be at Perigee on 12th, Apogee on 28th. 6 Mar.) Last Quarter 10 44 a.m. 13 „ ● New Moon 5 52 p.m. 19 „ ☾ First Quarter 11 30 „ 28 „ ○ Full Moon 1 33 „ The Moon will be at Perigee on 13th, Apogee on 27th. 4 April) Last Quarter 11 33 p.m. 11 „ ● New Moon 2 34 „ 18 „ ☾ First Quarter 2 8 „ 26 „ ○ Full Moon 6 5 „ The Moon will be at Perigee on 10th, Apogee on 23rd.
12	5.6	6.47	5.30	6.34	5.48	6.8	6.4	5.34	
13	5.6	6.47	5.31	6.33	5.48	6.7	6.4	5.33	
14	5.7	6.47	5.32	6.32	5.49	6.6	6.5	5.32	
15	5.8	6.47	5.32	6.32	5.49	6.5	6.5	5.31	
16	5.9	6.47	5.33	6.31	5.50	6.3	6.6	5.30	
17	5.9	6.47	5.34	6.30	5.50	6.2	6.6	5.29	
18	5.10	6.47	5.35	6.29	5.51	6.1	6.7	5.28	
19	5.11	6.47	5.35	6.28	5.51	6.0	6.7	5.27	
20	5.12	6.46	5.36	6.28	5.52	5.59	6.8	5.26	
21	5.13	6.46	5.37	6.27	5.52	5.58	6.8	5.25	The Moon will be at Perigee on 10th, Apogee on 23rd.
22	5.13	6.46	5.37	6.26	5.53	5.57	6.8	5.24	
23	5.14	6.45	5.38	6.25	5.53	5.56	6.9	5.23	
24	5.15	6.45	5.38	6.24	5.54	5.55	6.9	5.23	
25	5.16	6.45	5.39	6.23	5.54	5.54	6.10	5.22	
26	5.16	6.44	5.39	6.22	5.55	5.52	6.10	5.21	
27	5.17	6.44	5.40	6.21	5.55	5.51	6.11	5.20	
28	5.18	6.43	5.40	6.20	5.56	5.50	6.11	5.19	
29	5.19	6.43	...	...	5.57	5.49	6.12	5.18	
30	5.19	6.42	...	..	5.57	5.48	6.12	5.18	
31	5.20	6.42	...	...	5.58	5.47	...	...	

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane.

At Roma the times of sunrise and sunset may be roughly arrived at by adding 17 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

For the sunrise and sunset at Rockhampton, Townsville, Cairns, and other places in Queensland, readers may be referred to the "Queenslander" to which newspaper monthly astronomical notes will be supplied.—D.E.

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Agriculture.

CULTIVATION OF THE POTATO.

(Continued from February, 1918.)

BY THE EDITOR.

CROSS FERTILISATION.

Mr. Findlay, the celebrated raiser of so many new varieties of potatoes, in the course of a lecture before the Glasgow and West of Scotland Agricultural Discussion Society, spoke as follows on cross-fertilising and raising new varieties from seed:—

In the first place, I am distinctly of opinion that natural cross-fertilisation never took place in any part of the world at any period of the world's history. The blossom of the potato has a faintly sweet smell, yet it secretes no honey or nectar, and the pollen seems to be a bit too sharp and tasty to suit the palate of even the most voracious insect. In fact, it is highly poisonous, and I daresay that is where their objection comes in. I have seen now and again a bumble bee, no doubt attracted by the sweet smell of the blossom, alight on the edge of the petal, but never saw one explore the bloom, as is their habit where they expect to find either nectar or pollen. As the most casual observer will have noticed, the potato is an early closer, shutting up its blossoms between 2 and 3 o'clock in the afternoon, and, by reason of a certain twisting process, puts it out of the power of any nocturnal moth or other insect to gain access to either nectar or pollen, even though they both were there. In the second place, I hold it is utterly impossible for the pollen of one blossom to be wide-borne, and so fertilise another, even on the same plant, one reason being that it is too heavy, and another, and more important one, being that it is a bi-sexual plant. Both the sexual organs are in the same bloom, the anthers or pollen cases being the male parts, and the pistil representing the female. And it further appears to me that, for some reason which I have not been able to discover, the potato plant is by nature opposed to cross-fertilisation, for, immediately the pollen in the anthers is matured, the bloom twists itself up harder than ever round the pistil, and no longer opens out to greet the sun. The bloom then no longer stands erect on its stem, but begins to hang down, swaying in the breeze. The pollen falls down into the narrow space formed by the twisting of the petals, all around the bulbous point of the pistil. The bloom thus remains for the matter of two days, and then falls off. Strange to say, the pistil only absorbs a very limited portion of the pollen. Yet what is left, so far as I have been able to discover, is perfectly inert. The potato, as I have already said, is, in my opinion, opposed to cross-fertilisation.

HOW HE RAISES FROM THE SEED.

Continuing, Mr. Findlay said, dealing with his method of working:—First I get a shallow seed pan, such as gardeners use, attend to the drainage, fill it up, or nearly, with well-decomposed leaf mould, to which has been added a little fine sand. I take a flat piece of wood, and beat it down fairly firm and level, and sow the seeds thinly and evenly over the flat and firm surface. That done, I take and sift, after adding more sand, some more of this leaf mould. The sifting will remove all grit and stones. Now sprinkle a small portion over the seeds, but see that you do it evenly and not over-thick—as near to an eighth of an inch as you can; give also a slight beat down. If the mould is fairly moist, you need not give any water for at least two days. Set your tray, to be out of the way of mishap, into the sunny corner of a cold frame. Put a piece of old newspaper or other paper over the tray, covering up with a piece of glass. Your great care now is to see that you do not allow the earth or mould to get dry; at the same time you must guard against making it too wet. In a week or ten days your seed should begin to braird. You must then give them more light and air. With average care, in a very short time you will have nice plants. When about an inch high, put them out in small pots singly. In another three weeks or so, if the weather is suitable, and the season far enough advanced, plant them out in the open where you mean them to be permanently. After this, your work is all in the ordinary course; only, remember this, you must take care when you harvest them to keep the produce of every plant by itself—I mean those you intend to grow again. Fifty per cent. or more will be of no use to go further with; and this 50 per cent. left year by year, you, if wise, will further reduce, until at the end of four years you have only one or two left as the sole representatives of your labour and care.

I am not aware that any attempts have been made by Queensland potato-growers to raise new varieties from seed. The potato plant flowers freely in this State, although the flowers usually drop off before the fruit or “apple” is formed. Where, however, the “fruit” as distinct from the “tuber” comes to maturity, there is no other reason why Australian growers should not evolve a prolific disease-resisting potato equal to some of those lately raised from seed in England and sold at such enormous prices. A correspondent of the “Agricultural Gazette,” London, has, through the inquiry column of that journal, elicited the following instructions for raising new varieties from seed:—

Those who desire to produce new varieties of potatoes must first practise the art of cross-fertilisation, and must possess abundant patience. Like many other species which are not habitually multiplied by seed, the potato has a remarkable tendency to revert to the wild form. It may be necessary to cultivate 100 or even 1,000 seedlings, before finding one which is really worthy of a place among the better varieties already existing. M. Vilmorin says that in France the raising of seed potatoes has been proceeded with in a somewhat haphazard manner; whereas in England, on the other hand, a more systematic method has been followed, richness in starch, excellence of flavour, power of resisting disease, with little tendency to develop haulm, being the characters we on this side of the channel generally seek. With regard to cross-fertilisation, it is rather a delicate operation, and needs time and attention to details. Directly the flower begins to open, the anthers must be removed carefully with a pair of fine-pointed scissors. This is necessary to prevent its own pollen from falling on the stigma and self-fertilising the ovary. It is well also to tie a piece of soft muslin round the emasculated flower. You have now to examine the flowers of the other variety which is to act as the male or husband. You may have to examine dozens of flowers before you will find one with its anthers bearing the precious pollen in a powdery form, as some varieties are exceedingly shy pollen-bearers, owing to the energies of the plant being occupied in producing tubers at the expense of full development of its masculine attributes. When you find the pollen dust, collect it carefully on the point of a clean, dry camel-hair brush, and gently brush it on the point of the stigma or female organ that you had previously protected by means of muslin. You must, however, not do this prematurely, but wait till you observe the point of the stigma covered with a viscous-looking fluid. Then, and then only, the stigma is ready for the nuptial rites to be performed. Do not remove the muslin; this will serve to prevent the berry when ripe from falling and scattering its precious seeds. It will easily be ascertained when the berry is ripe, and then the latter should be gathered, placed in a box in a room to become thoroughly dry, after which remove the seeds, place them in a packet, and store them away safely till spring. But, when the seed has been saved after much pains and trouble, it will require some humouring when it is time to sow. Then the seeds should be sown in pans or shallow boxes 3 in. deep, containing an inch of drainage, then a layer of moss, and sufficient compost, equal parts of light loam and leaf-mould, to fill the box or pan to the top. Press the compost down firmly with a piece of board, and sprinkle some fine sand over it. Sow the seeds thinly, and then cover with an inch of finely sifted mould.

The soil must not be too moist or too dry, as the seeds may die in one case or rot in the other. The seedlings should appear in about ten days, and they must have abundance of fresh air. Some writers suggest that the soil should be baked before sugaring it over the seeds, as the damping-off fungus is rather to be dreaded.

JUDGING POTATOES AT SHOWS.

Because a potato has a high-sounding name, and because it is a new variety, judges are satisfied to examine the interior and exterior of the raw potato and award it a prize or disqualify it according as its symmetry and healthy appearance appeal to their judgment. But does this examination satisfy the public? What the farmer wants to **know** is, its cropping power and its powers of resisting disease, and its early or late appearance on the market. What the housewife wants to know is, what are its cooking properties. It is of little importance that a certain potato exhibit has obtained first prize, for a crop must be a very poor one if, out of 5, 10, or 20 acres a bag or two of tubers cannot be obtained which will satisfy a judge in all that concerns the eye. But there are splendid-looking potatoes which will not stand the cooking test. Some, when cooked, smell of the earth; others show none of that beautiful mealy appearance which is the characteristic of a good cooking potato. One that bursts its jacket when properly cooked, and shows a beautiful dry mealy exudation is surely preferable to one that is soapy or waxy. The market price of potatoes depends largely on the quality of the cooked tuber. At some shows the judges are supplied with a plate of hot cooked potatoes of each variety exhibited, and thus are able to determine what, after all, is the only true test of the value of a potato—its cooking qualities. Size is certainly not everything. It would be a move in the right direction if all potato exhibits at shows were accompanied on judging day by a dish of each variety cooked by an artist—for to cook a potato properly is a work of the culinary art not understood by all cooks.

QUANTITY OF SEED POTATOES REQUIRED TO PLANT AN ACRE OF LAND.

Those farmers who have been planting potatoes year after year do not require to be told how many hundredweights or tons they require to plant a given area, but there are many taking up farming nowadays for the first time, and not being brought up to the business, have a very little, if any, idea of the quantities of any kind of seed required per acre for field crops. To such amateur farmers the following advice will be acceptable:—

The quantity required to plant an acre of land with potatoes is, of course, regulated by the size of sets and the distance apart they are planted. There is a great difference of opinion as to the size of sets to use. Generally, when potato-growers are discussing the size of sets to use, if they are asked what weight the sets should be they don't seem to know what is meant. One man says he prefers a good big set, another man prefers a small set—neither man seems to know the weight of the sets he is advocating. It will perhaps be a guide to some growers to know that a potato as large as an egg weighs as much as the egg, and an ordinary hen egg weighs 2 oz. Some growers consider a potato as large as a hen's egg will make two sets—this would be 1 oz. for each set. With potatoes planted 2 ft. from row to row and 1 ft. apart in the rows, it would take 21,780 sets, and the sets weighing 1 oz. each it would take 12 cwt. 0 qr. 17 lb. 4 oz. of seed to plant an acre; this is about the distance apart generally adopted in small gardens. On the farm potatoes would require to be planted about 2 ft. 6 in. by 1 ft.—this would take 9 cwt. 2 qr. 25 lb. of seed; with 1 oz. sets at 2 ft. 6 in. by 1 ft. 3 in. it takes nearly 8 cwt. of seed. The size of sets is one of the most important things the farmer that has to buy his seed has to consider. Seed potatoes the size of hen eggs are the most economical to buy; each potato will make two sets, and each set will grow as good a plant as a whole potato the size of an egg.

DISEASES OF POTATOES.

It is perhaps not stating too much to say that a very large percentage of disease is due to two specific causes, both of which could be prevented.

Unfortunately, the means of prevention do not generally commend themselves to the majority of Queensland potato-growers. An important fact which has been observed is, that when diseased potatoes are planted, after the crop has been lifted, the remains of the old seed potatoes, when brought to the surface of the ground, will produce a crop of fungus bearing myriads of spores. If such old seed potatoes are kept buried in soil until the following season, and then exposed to light under favourable conditions, fungus fruit is still produced, and continues to grow so long as a scrap of the old potato remains. One often sees in horticultural periodicals statements to the effect that, say, 10 acres of badly diseased potatoes were ploughed in, not being considered worth lifting. Now, in the face of this, it is not difficult

to understand where the germs that first infest a crop come from, and with the well-known necessary conditions of moisture and warmth, an epidemic breaks out at once. If the necessary conditions are wanting, however, the fungus, although present, cannot attack the potato leaves; but the absence of disease does not necessarily prove the absence of the fungus, but only the absence of the conditions necessary to enable the fungus to attack its host. In all probability, the fungus is always present in land where potatoes are grown at short intervals, as in this State.

It is just as important to collect the old "sets," or the whole crop of diseased potatoes, as it is to gather the sound ones. "But," says the farmer, "such work would never pay." It might not appear so, but eventually it would more than pay.

A second very fertile source of disease is due to planting infected potatoes. Perhaps no farmer would plant obviously diseased potatoes, but the danger arises when the potatoes exhibit none of the external signs of the disease, but, when cut, just show indications of the discoloured patches characteristic of the fungus. The obvious check to this source of danger is to cut all potatoes used for planting, refusing those suspected of being diseased.

POTATO SCAB.

This disease, characterised by the presence of scurvy or scab-like patches on the skin of the potato, is very prevalent during certain seasons; and, although the edible portion of the potato is not injured, the market value is much depreciated. There is also another form of scab superficially resembling the one described, caused by an organism called *Oospora scabies*. The disease is prevented in both cases by steeping seed potatoes for two hours in half a pint of formalin mixed with 15 gallons of water.

Another remedy is said to be efficacious, and that is, to dissolve 2 oz. of corrosive sublimate in 16 gallons of water; when fully dissolved, put the seed potatoes in a bag and immerse them in the mixture, not leaving them to soak, but only long enough to ensure that all the seed is thoroughly wetted. Corrosive sublimate is highly poisonous, and must be handled carefully, a wooden vessel being used to dissolve it in. A potato affection was, in 1899, brought under the notice of the Queensland Department of Agriculture as occurring in the Gramzow and Alberton districts of Beenleigh, and it was found to be identical with the new disease of the potato plant whose nature and cause were first made known in 1894 by Mr. Henry Tryon, Government Entomologist. The disease was probably brought into the Beenleigh district many years since in seed potatoes.

The symptoms of the disease are as follows:—

When the potato plant is in process of vigorous growth, and exhibits every evidence of health, it suddenly commences to droop as if lacking moisture; after a few hours it generally becomes flaccid, its branches bend downwards, and its leaves have their edges turned inwards so as to expose their under surface. These events happen in a few hours, and the plant thus smitten never revives, but gradually succumbs. On examination, the roots and tubers will be found, to all appearances, perfectly sound. But careful examination reveals a faint, ring-shaped line, which is seen on the section of a healthy tuber at a short distance within and parallel to the surface. This ring of the healthy tuber is more evident than usual from having become darkened in colour. Later on, an opaque, thick, white, tenacious fluid exudes in minute quantity from the eyes of the tuber; and it is this which causes the earth to strongly adhere to these points when the tuber is taken from the ground and permitted to dry. If kept perfectly dry, the tuber usually undergoes no destructive changes; but if left in the soil, or placed in a damp atmosphere, destructive changes occur and eventually the whole potato becomes a mere mass of corruption. Mr. Tryon has described minutely the whole course of the disease in the issue of this Journal for July, 1899, to which I refer my readers.

TREATMENT.

As soon as the disease is recognised, every part of the affected plants should be removed, leaving not a particle behind. Then the ground should be opened up and lime applied to kill the plant-microbe. Once the disease has shown itself, potatoes should not be again planted for the succeeding crop on the same land, but two or more crops of, say, maize or brown millet, should be taken off. It should be noted that no plants of the same order should be planted on the infected ground, especially not tomatoes.

THE IMPORTANCE OF SPRAYING POTATOES.

A few experiments conducted by the University College of North Wales in spraying potatoes clearly emphasise the importance of conforming to this modern innovation in farm practice. These trials were carried out on different farms in the counties of Anglesey, Carnarvon, Denbigh, and Flint. In every single instance

spraying gave good results, in some cases markedly so. In the matter of marketable potatoes the average in the unsprayed crops was 7 tons 19 cwt. 96 lb. per acre. When sprayed once there was an increase of 1 ton 8 cwt. 91 lb.; sprayed twice, 2 tons 1 cwt. 26 lb.; but the late spraying did not effect such a large increase. There were fewer small potatoes by the use of the sprayer, and less than half the diseased tubers when twice sprayed. The following directions have been issued by Professor Winter, indicating how the operations may be carried out:—

Directions for Spraying Potatoes.

The following dressing is sufficient for 1 acre:—24 lb. sulphate of copper (98 per cent. pure), 30 lb. pure washing soda, 120 gallons of water. Washing soda is recommended in preference to lime. As in practice it will usually be difficult to dissolve the above quantity at one operation, we would suggest that the mixture should be prepared in a wooden vessel which will hold 25 gallons of water. First wash out this vessel thoroughly, and pour into it 15 gallons of clean water; then take 4 lb. sulphate of copper broken to a fine powder; place it in a canvas bag and stir it about in the water until the sulphate of copper is all dissolved. Next dissolve 5 lb. of washing soda in 5 gallons of water in a separate tub; then pour the washing soda solution into the sulphate of copper solution, and stir well. The mixture should then be tested with blue litmus paper; if the litmus is turned red more washing soda should be dissolved, and steadily added until fresh litmus paper put into the solution remains blue. The quantity of material thus prepared is sufficient for one-sixth of an acre. As the nozzles of spraying machines are easily choked, the mixture should be poured into the machine through a canvas cloth. Spraying should be done twice, three weeks apart.

PREPARATION OF THE SOIL.

In regard to ordinary tillage cultivation, it is indisputable that land intended to bear a good yield can scarcely be brought to too fine a tilth. The rootlets will spread with greater rapidity, and be enabled to take up their nutriment better, if the soil is well pulverised.

If forest land is to be operated on, the first work necessary is, of course, stumping and clearing off the growing timber at least two months before the land is to be broken up. If the soil is black and heavy, as it is in many parts of the State, notably in the Lockyer district and on the Darling Downs, it should be broken up in the autumn, and allowed to lie fallow until the end of June, when it should be harrowed down as fine as possible, and then well rolled. Then the land should be ploughed a second time, crossways, to a depth of 8 in. or more. By so doing the sour soil is turned to the top, and the soil which has been mellowed by sun and rain will be laid under.

Now let the land lie till the end of July. At that time, scarify it with a cultivator, and then give it a final ploughing and harrowing, when it will be in fit condition to be planted in September.

If new scrub land has to be dealt with, when the scrub has been felled and burnt off, the stumps will remain in the ground for some three years, when most of them will have rotted out or can more easily be removed than when they were green. But although the whole of the land is permeated with a network of roots, potatoes may be planted by breaking it up in rows 2 ft. wide with a strong hoe, which easily cuts through the soft roots of the scrub trees. There is no danger in this case of stagnant water collecting in the rows, as the porous scrub soil will drain off the superfluous moisture; hence potatoes can endure far more rain in such soil than if planted on forest land or on black-soil plains.

The season for planting having arrived, the next thing to consider is whether whole potatoes or cut sets should be planted. This will all depend upon the season, whether the autumn or the spring sowing. For the winter crop whole seed is preferable, whilst cut sets are usually planted for the summer crop. I have already given the quantity of seed potatoes required per acre as varying from 8 to 12 cwt., according to circumstances, distance between rows and plants, and the use of whole or cut potatoes being the chief factors determining the quantity needed. When the seed is cut, it is well to sprinkle the sets with dry ashes, which will have the effect of hardening the cut surfaces and preventing the possibility of rotting should the seed lie over long in the ground before coming up. If, however, the seed has been properly sprouted before planting, there is little danger to be apprehended. The seed should be carted to the field in bags and placed at convenient distances along the rows, which are now being drawn to a depth of about 5 to 6 in., at a distance of 2 ft. 6 in. apart. The sets are laid in the furrow at from 12 to 14 in. apart, cut side down. The planted rows may be covered with the harrow.

GROWING POTATOES ON THE SURFACE.

Very good crops of potatoes have been produced without putting the set underground. The tuber itself is not the root of the plant, but merely an excrescence which contains plant food. The roots themselves, which are fibrous and branched, are produced below the tubers; and, provided they have a suitable soil to enter, the plant will flourish, and tubers will be produced, if certain conditions are observed. The method is as follows:—Break up the soil, and work it down fine, manuring it with stable manure or chemical fertilisers. Plant the sets on the surface, and press them into the soil until half buried, or just cover them with a little light soil; then cover the plot with straw, grass, or similar material to a depth of from 2 to 3 ft., and keep it moist. The potato stems will grow up through the straw, and produce tubers in the lower layers. The straw must be just kept nicely moist. An old method of producing a constant supply of tubers is described as follows:—Place the sets about 6 in. apart each way; build round the plot a pen with rails several inches apart, cover with straw to a depth of 3 ft. or more, and throw over it a few buckets of water occasionally. The tubers produced can be removed as far as the arm will reach through the crevices, from time to time, without seriously disturbing the plants. A large quantity of smooth, clean potatoes of good quality can be raised on a comparatively small area by this means.

GROWING BY IRRIGATION.

Where irrigation is adopted it is possible to ruin a whole crop by unscientific watering. The potato certainly delights in a cool moist soil; but it is one thing to apply the right amount of moisture and another to saturate the soil. As a general rule, the haulms should be allowed to attain a good degree of growth and be well in blossom before water is applied.

Some varieties require more water than others, and, some soils being porous and others retentive, varying quantities of water will be needed. Water applied too soon will often turn the vines yellow, and permanently check their growth. On the other hand, if the ground is very dry at the period when the potatoes are setting, as we term the formation of the young tubers, it often happens that no after application of the water will remedy the matter, and a short crop is the result. When the ground gets very hot and dry, and the vines turn dark-coloured and cease to grow, water becomes necessary at no matter what season, unless the crop has already matured. If the subsoil is lacking in warmth, it will be found fatal to apply water, even if the soil is very dry. One good watering will often mature a crop of potatoes, but, if the growth of vines is heavy and shades the ground well, two or even three waterings will increase the yield, and can, in no ordinary case, injure it. Thorough cultivation should follow each application of water, otherwise the water furrow will dry and cake, and this is most detrimental to the crop. As in the irrigation of other crops, the irrigation furrows should not be too long, because the water takes some time to go through, and the upper end, by the time the lower end has sufficient water, will have had far too much. In sandy soil water may be run for three or four hours, while in tenacious soils the irrigation may continue for eight or ten hours.

There is one very important point to note in connection with potato-growing by irrigation. Once watering has been begun, the ground should never be allowed to become dry. If this is neglected, the growth of the potato stops. Then growth is started again by a succeeding watering, with the result that the tubers will be irregular in size, or a second crop will be set, thus giving a large quantity of small or ill-shaped potatoes. This we have amply proved in a small crop of Sir John Llewellyns and Northern Stars we took up in December. The watering had been done fitfully, the ground being sometimes allowed to become quite dry. The result was that there were large numbers of small Sir Johns besides a second crop just set, whilst the Northern Stars resembled nothing so much as miniature dumb-bells, some taking the form of stumpy carrots. If potatoes are irrigated before the setting of the tubers, a greater number will be formed than the plant can properly support, few of them becoming large enough for market. On the other hand, if irrigated after the tubers have formed, there will be fewer tubers but a large crop of uniform marketable size. Deep cultivation, and thus keeping the ground mellow, is most important. The field should never be flooded, nor should the water be allowed to reach the crown or stem of the plants. The tuber is not the root of the plant, and it is the roots, not the tubers, which have to be watered. When the plants are 5 or 6 in. high, the roots are several times that length, and no more deep cultivation should be given them. It is sufficient to use some form of cultivation which will keep about 2 in. of the surface thoroughly pulverised.

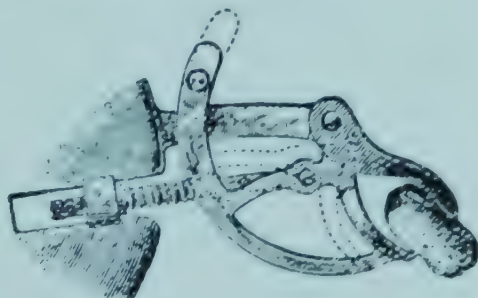
As soon as planting is done, the land having been previously well flooded if the weather is dry, harrow with the row, using bull tongues set to run as deep as possible next the row, the outside ones being set shallow. As the potatoes begin to grow,

reverse the shovels, running the outside deep and the inside ones shallow, so as not to disturb the roots. Cultivation should be continued as long as the row can be seen. It should be understood that, with irrigation, the land must be well drained or so porous that the superfluous water can easily escape. Stagnant water is fatal to any crop except rice, and especially fatal to potatoes.

Where irrigation is out of the question owing to want of sufficient water supply or to the undulating nature of the land, deep and constant cultivation and thorough pulverisation of the soil will go far towards making a heavy crop.

POTATO PLANTING MACHINES.

In America and in many parts of Europe, potatoes are now, and have been for some years, planted by machines drawn by horses, which make the drills, drop the sets into them, and cover them. In some machines, the sets are picked up by revolving spikes; in others, there is a finger-and-thumb action, which avoids piercing the sets



in the hopper. The fingers pick up the potato, hold it as the disc revolves, when a cam opens the fingers, and the potatoes drop into their places as though put in by hand. The machine will plant ordinary seed potatoes with only 5 per cent. of missed plants. The weight of the planter is about 7 cwt.

A HAND PLANTER.

This apparatus was invented in 1902 by the Hon. Cecil Jervis, Nottinghamshire. It is remarkable more for its simplicity than intricacy. The accompanying block shows at once the principle of the implement. By the old system of hand planting, 1 acre a day was very hard work for a man; but, with the Jervis Potato Planter, a man can comfortably plant 2 acres a day. Emerson says: "There would be more



tillers of the soil if the work could be brought breast-high," and the doctrine of the eminent essayist finds practical application in this appliance. Stooping is done away with, uniform work is assured, and the labourer can plant at walking speed. Three potatoes are taken at a time from a hopper slung over the shoulder, and dropped into the planter. The hopper is hollowed on one side to fit the body. The planter deposits the seed with great accuracy.

AFTER CULTIVATION.

Cultivation follows planting very closely, but interference is not needed, if the land is clean, until the haulms begin to show above the ground; then it is necessary to run a light, one-horse harrow over them, which can be safely done until the stalks are up some 2 in. above the ground, without any injury to the aftergrowth. This method will save a great deal of labour with the hoe, of which, however, there will be plenty needed before the potatoes are fit to hill. The more work that is done among the roots in the way of loosening the soil, either with hoe or scuffler, between the rows, the more likely is the farmer to get a fair return for his labour, provided always that the season be favourable. But even if the weather be dry, cultivation will be a great help to the plants by preventing evaporation of what moisture may be present in the soil. The farmer must, however, be careful to avoid disturbing the plant after the tubers are formed on the rootlets, and, therefore, he should not cultivate too closely.

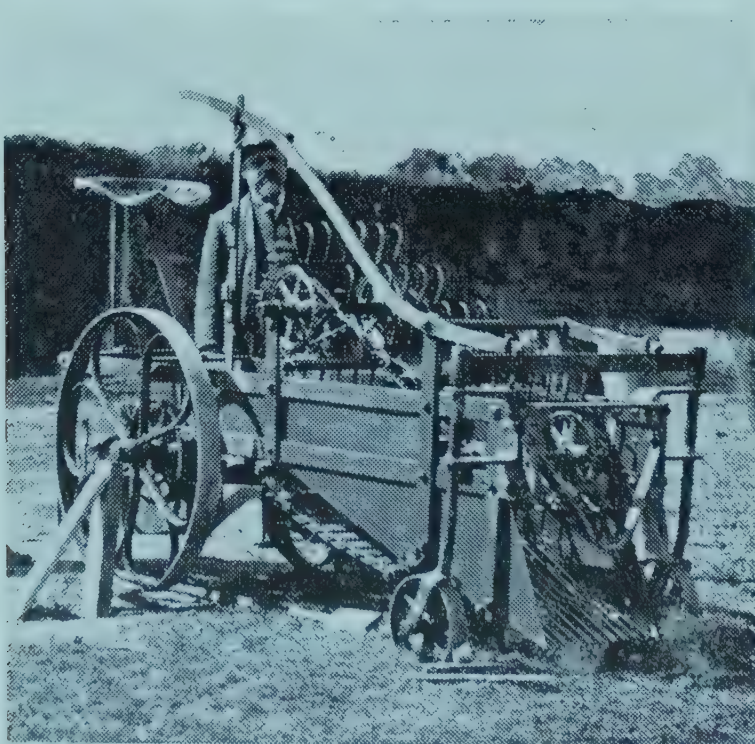
As the haulms grow higher, fresh soil must be drawn around them; in other words, they must be hilled up as the plants grow. This provides fresh plant food, supports the haulms, and keeps off superabundant moisture.

HARVESTING.

The first thing to make sure of before digging the crop is whether the tubers are sufficiently ripe to be lifted. The surest signs of maturity are the drying off of the haulms, and the firm setting of the potato skin. The winter crop may safely be left in the ground until the tubers are dead ripe, as there is little fear of any damage being done to them by flies and other insects; but the summer crop runs great risk from the potato fly and from sun heat. It is therefore advisable to take the latter up as soon as the haulms begin to wither and turn brown. The skin will not be so firmly set, and hence the potatoes will have a ragged appearance, and will not keep so well as if they had been allowed to remain in the ground until perfectly ripe.

Potatoes may either be taken up with a digging fork, with a long-handled shovel, with an ordinary plough, with a potato-digging plough, with the potato-digging machine, of which latter there are several in the market, and two—the Daniels and the Jackson—lately invented and perfected in Queensland by the inventors whose names they bear.

In the early days of potato-growing in the light scrub soils, I found the long-handled shovel a better implement than the fork, no potatoes being left in the ground; the labour also being less back-breaking. One ton a day was a fair day's work with this implement, and none of the potatoes were injured by a tine of the fork being stuck into them. A swing plough will do the work more expeditiously, of course, and without the same risk of damage, but still there is always some damage done by



THE DANIELS MACHINE.

scratching the tubers; and, if the ground is at all weedy, many potatoes will be left behind, which will have to be picked up by hand when cultivating for the succeeding crop.

In the absence of a regular digging machine, perhaps the cleanest way to take up a potato crop is to strip each side of the rows and then run a light plough down their centre, turning up all the potatoes.

Of the digging machines, the lightest and easiest worked by two horses are the two abovementioned. The Jackson machine simply digs the potatoes, but does not grade them. Both machines are equal to digging 5 acres a day.

Where the land is free, and there are no weeds, such as fat-hen and thistles, the machines do excellent work, and are a great saving of labour. To make the best work, the dry top of haulms and all weeds and rubbish should be removed prior to the machine being put to work. Since the advent of the blight, even if the digging is to be done by hand, it is advisable to clear the "shaws" off, and burn to stop further infection by their coming in contact with the sound tubers after they are brought to the surface. In old times it was customary to make use of the haulms for covering heaps of roots that had to be left in the field over night. But as it is almost impossible to be certain that no small spores of disease are lurking in the haulms, even in what are considered clean crops, it is advisable to run no risks and have the tops destroyed right away, fire being the best thing if the weather will allow.

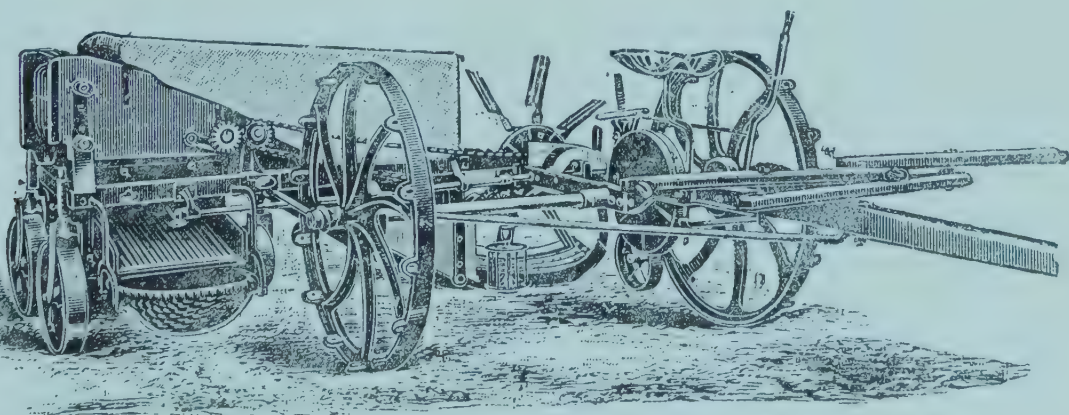
STORING POTATOES.

When handling potatoes for storing, treat them as eggs, careful handling means much as to the keeping qualities of potatoes. When extra labour has to be employed in raising potatoes, the greatest trouble is not slovenly digging; that can be rectified by after cultivation with harrow and plough. After the cleanest of diggers there will be some left, so that it is only a question of a few extra bags to be picked up when ploughing. It is in getting men to sort them as they should be where the trouble lies.

There are several methods in practice in the matter of storing potatoes; one is effected by putting a covering of some 6 in. of straw on a prepared heap of potatoes, and, on the top of the straw, laying another 6 in. of dry earth. But experience has shown that such a covering is too air-tight, causing fermentation and decay. The method I adopted was to place potatoes in a heap upon a high and dry patch of land and cover well with blady grass. By this plan, I succeeded in saving all my seed potatoes in the sixties, at Oxley Creek, when heavy rains culminated in high floods. There is another way, which is to lay them on the barn floor and cover them with straw. This covering, whether out of doors or indoors, is necessary to keep them in serviceable condition. To heap up the summer crop, when first lifted, is a great mistake, as they are sure to heat and decay. In any case, potatoes should not be heaped up whilst in a damp condition, as they will very quickly become valueless. Stored potatoes should be carefully sorted a week or so after they are taken out of the ground.

POTATO GRADER.

The accompanying illustration shows a device for rapidly and easily sorting potatoes as they are taken from the ground. The upper incline has, crosswise, rounded strips with spaces between as a flooring. As the potatoes pass down the incline, the small ones fall through the openings into the lower incline, the large tubers falling into one basket and the smaller into the other. The strips being rounded do not bruise the potatoes.



AN ENGLISH POTATO GRADER.

A DISEASE-RESISTING POTATO.

When the new varieties of potato, such as the Northern Star, Sir John Llewellyn, Up to Date, Evergood, and others were placed on the market about five years ago, as absolutely disease-proof, and as being enormously prolific, at exceedingly high prices (as much as £50 being paid for a single tuber), high hopes were entertained that disease in potatoes would be, for a series of years, at least, a memory of the past. But, alas for delusive hopes! Disease became much in evidence, especially in Northern Stars. In 1906, however, at a meeting of the Royal Horticultural Society, Edinburgh, a wellknown specialist in potato-breeding exhibited tubers of what is said to be a disease-proof potato. It was not a new variety, rather a very old one, and was supposed to be lost to cultivation; but Mr. T. A. Scarlett discovered it and brought it to light. It is said, in connection with this potato, that there is documentary evidence to show that, though grown since 1745, it has never shown the least sign of disease. It is a black, Scotch kidney, called "Trochie Grant." I have, so far, heard nothing further about this potato, either as to its cropping powers or edible qualities. The colour, of course, is not quite what is wanted in these days; but it is something to hear of a variety that has never been known to take the disease; and, with this potato to work on, hope is given that a disease-resisting variety of modern type may yet be raised. Such a potato would come as a boon to farmers and others who suffer more or less every year with disease in this important crop.

THE ALGAROBA AND LOCUST BEANS.

Mr. W. Leslie, Inspector under the Plant Diseases Act, sends us the following useful remarks on an article we published, in the February issue of this Journal, on "Algaroba, Carob, or Locust Beans." He also sent a photograph of a bean-bearing tree—the *Pithecolobium saman*, which has a spread of branches of 300 ft., the area covered by it being 1 acre 2 roods 19 perches, which arrived too late for reproduction in this month, but will appear in the April number of the Journal.

Mr. Leslie writes:—

"With reference to article in February issue, page 71—Algaroba and Locust Beans—it may be useful to note that *Pithecolobium saman*, commonly called the 'Saman Tree' in the West Indies, is favoured there above all others as a shade and pasture tree. It possesses the following admirable qualities for this purpose:—

1. It shades a very large area.
2. The shade is not heavy enough to prevent a healthy growth of grass.
3. It roots deeply, and instead of impoverishing the surface soil it enriches it by its copious deposit of nitrogen-bearing matter in the form of decayed leaves and flowers. (It is largely due to this 'incidental increment' that grass grows richer under its shade.)
4. The leaves close up at night and admit a deposit of dew on the grass underneath.
5. The large beans (7 in. by 1 in.) are plentifully produced in the dry season and form valuable feeding for stock, their sugar-content being high.

"A photo. taken by the writer in the West Indies shows a Saman tree covering 1 acre 2 roods 19 perches."

MANGO CHUTNEY.

The following is a good West Indian recipe for making Mango Chutney:—3 lb. mangoes (turned, but not ripe), 3 lb. tamarinds, 2 lb. raisins (weighed after stoning), 8 lb. brown sugar, $\frac{1}{2}$ lb. chillies, 2 lb. green ginger, $\frac{1}{2}$ lb. garlic or $1\frac{1}{2}$ lb. onions, $\frac{1}{4}$ lb. mace, 1 oz. mustard seed, $\frac{1}{4}$ oz. cloves, $\frac{1}{4}$ oz. pimento, and $\frac{1}{2}$ lb. table salt.

Soak the tamarinds in 2 quarts of the best vinegar; stir them about with a wooden spoon to get the pulp off, and take out the seeds and the leathery part in which they are enclosed. Cut the raisins small. Peel the ginger and grate it. Pound the chillies, garlic, and mustard seed in a mortar, using a little vinegar to moisten. Mix all together thoroughly; it is then ready for use.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The following revised list of breeders of purebred cattle is published for the purpose of informing those who desire to improve their stock where the best cattle can be obtained in the State. The Department of Agriculture and Stock takes no responsibility in relation to the entries in the list; but, when inquiries were first made, the condition was imposed that the entries were to be only of stock that had been duly registered, or that were eligible for registration in the different herd books. The entries received were, in some cases, somewhat too confusing for proper discrimination, it has, therefore, now been decided that only such cattle as have been registered will be included. The lists previously published in the *Queensland Agricultural Journal* have now been withdrawn for revision.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
F. C. G. Gratton ..	"Towlestone," Kings-thorpe	2	14	Holstein Cattle Club Herd Book
T. Mullen	"Norwood," Chelmer	3	20	Queensland Jersey Herd Book
J. H. Paten	Yandina	6	21	Ayrshire Herd Book of Queensland
Queensland Agricultural College	Gatton	4	38	Ayrshire Herd Book of Queensland
		..	2	Ayrshire Herd Book of Scotland
		2	9	Holstein-Friesian Herd Book of Australia
		2	31	Jersey Herd Book of Queensland
		10	42	Ayrshire Herd Book of Queensland
J. W. Paten	Wanora, Ipswich ..	4	12	Queensland Jersey Herd Book
M. W. Doyle	Moggill	1	15	Herd Book of the Jersey Cattle Society of Queensland
G. A. Buss	Bundaberg	2	10	Milking Shorthorn Herd Book of Queensland
W. Rudd	Christmas Creek, Beaudesert	5	27	Herd Book of the Jersey Cattle Society of Queensland
M. F. and R. C. Ramsay	Talgai, Clifton ..	12	47	Holstein-Friesian Herd Book of Australia
George Newman ..	Wyreema	9	21	Queensland Jersey Herd Book
R. Conochie	Brooklands, Tingoor			

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
W. J. Barnes	Cedar Grove ..	10	37	Queensland Jersey Herd Book
T. B. Murray-Prior ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
W. J. Affleck	Grasmere, N. Pine ..	6	31	Queensland Jersey Herd Book
A. J. McConnel	Dugandan, Boonah	19	36	Australian Hereford Herd Book
A. Pickels	Blackland's Stud Farm, Wondai	4	62	Illawarra Dairy Cattle Herd Book of Queensland
G. C. Clark	East Talgai, Ellinthorp	3	7	New Zealand Herd Book
H. D. B. Cox	Sydney (entered brother's name)	3	16	Commonwealth Standard Jersey Herd Book
J. T. Perrett and Son	Coolabunia	2	36	Illawarra Herd Book of Queensland
State Farm	Kairi	4	8	Ayrshire Herd Book of Queensland
		1	2	Holstein-Friesian Herd Book of Australia
		45	127	Australian Hereford Herd Book
E. M. Lumley Hill ..	Bellevue House, Bellevue	2	22	Illawarra Herd Book of Queensland
W. T. Savage	Ramsay	50	400	Australian Hereford Herd Book
Tindal and Son	Gunyan, Inglewood	3	28	Queensland Jersey Herd Book
J. N. Waugh and Son	Prairie Lawn, Nobby	9	55	Ayrshire Herd Book of Queensland
J. H. Fairfax	Marinya, Cambooya (2)	25	100	Queensland Shorthorn Herd Book
C. E. McDougall	Lyndhurst Stud, Warwick (2)	6	20	Ayrshire Herd Book of Queensland
J. Holmes	"Longlands," Pittsworth	1	20	Illawarra Dairy Cattle Association
P. Biddles	Home Park, Netherby	1	9	Milking Shorthorn Herd Book
A. Rodgers	Torran's Vale, Lane-field	1	..	Holstein-Friesian Herd Book of Queensland
R. S. Alexander	Glenlomond Farm, Coolumboola	2	..	Holstein-Friesian Herd Book of Australia
		3	83	Ayrshire Herd Book of Queensland
State Farm	Warren	2	15	Holstein Cattle Club Herd Book
S. H. Hosking	Toogooloowah ..	2	11	Queensland Jersey Herd Book
W. J. H. Austin	Hadleigh Jersey Herd, Boonah	..	6	Commonwealth Standard Herd Book
Ditto	ditto	7	21	Ayrshire Herd Book of Queensland
H. M. Hart	Glen Heath Stud, Yalangur	3	9	Holstein-Friesian Herd Book of Queensland
C. Behrendorff	Inavale Stud Farm, Boonah	25	77	Ayrshire Herd Book of Queensland
F. A. Stimpson	Ayrshire Stud Farm, Fairfield, South Brisbane	5	21	Ayrshire Herd Book of Australia
M. L. Cochrane	Paringa Farm, near Cairns			

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
Albert Cook	"Greenmount," Mackay	1	8	A.-A. Stud Book, New Zealand
Thomas Brown	"Bellgrove," Kingaroy	1	14	Do.
Higgins Bros.	Sandy Creek, Leslie, Q.	6	2	Do.
Calcino Bros.	"Summariva," Charleville	3	4	Do.
W. M. McKelvie	"Undulla," Miles ..	5	4	Do.
James Connors	"Glen Erin," Nanango	1	2	Do.
J. A. Mackintosh	"Yundah," Warwick	2	8	Do.
M. J. Luff	Kaimkillenbun ..	1	1	Do.
A. Spencer	Brisbane	2	1	Do.
Beak Pastoral Co.	Rockhampton ..	2	10	Do.
E. Swayne, M.L.A.	West Plane Creek ..	1	2	Holstein-Friesian Herd Book of Queensland
Godfrey Morgan	"Arubial," Condamine	3	6	Queensland Shorthorn Herd Book
John Anderson	"Fairview," Southbrook	7	34	Ayrshire Herd Book of Queensland

HOW MUCH DOES A RABBIT EAT?

Mr. R. G. Skelton, of Otley, Inverell, writing to "Sydney Stock and Station Journal," gives some interesting, not to mention astounding, figures on rabbits. They look all right on paper, but it is a matter of conjecture as to how they work out in practice. He writes:—

"Does anyone know how much feed a rabbit eats? This is my experience:

"My children caught a young one, and were playing with it in the garden, and he got under the house, and used to come into the garden at night to feed. Result was that if we hadn't laid wait and destroyed it quick and lively, the garden would have been wiped out in a week. His large appetite struck me so much that I decided to test what a rabbit would really eat.

"I caught a young one, and kept him for a few days till he settled down to feed in his box, then weighed him, and he went 6½ oz.; then I kept the feed (radish tops and lettuce) up to him for twenty-four hours, and he ate 15 oz. in that time. (No mistake about this, and he wasn't prepared by starvation for the test either.) That is, he ate more than twice his own weight in twenty-four hours. Now, does this mean that a full-grown rabbit (which I find averages about 4 lb.) eats more than, or even twice, his own weight. If it does, then I lose 26,071 tons of feed per year by rabbits, because I reckon I have been carrying 20,000 rabbits on Otley. I consider this right, because I put a man on poisoning for a few months, and he got 7,000 full-grown skins, and easily lost another 3,000 full-grown rabbits that died off the trail. And I reckon he only got half the rabbits.

"According to this theory, I've lost 26,071 tons of feed per year by rabbits. Valuing this at least £1 10s. per ton means that on this place of 12,600 acres rabbits have eaten at least £39,106 worth of feed per annum. Makes one think a bit, doesn't it? And I hope it's enough to make rabbit-breeders swallow and digest.

"Now for another matter that might be interesting to rabbit-breeders. I came here four years ago, and I reckon the rabbits are no thicker now than they were then. As I've said, I've been feeding 20,000 rabbits, which I suppose means there were 10,000 does (females). Now, supposing each doe has at least five kittens a year, that means an increase of 50,000 rabbits per annum. Well, where have the 50,000 increase been going to? In my opinion they are destroyed by natural enemies, such as foxes, cats, &c.

"Well, there it is, gentlemen, and if you think these figures are worth driving down the throats of rabbit-breeders you are at liberty to do so."

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, JANUARY, 1918.

Another very unfavourable month for egg production has been passed through. Almost continuous rain has prevailed throughout the month. The number of eggs laid for January was 6,092. E. Chester again leads in the light breeds with 144 eggs. In the heavy section R. Burns and Mars Poultry Farm are equal for first place with 113. A large number of the birds are moulting. Broodiness had not been so prevalent during the month, but the total cases amongst some of the birds, and the time taken to get over each period do not leave much time for laying. In thirteen pens in the six-hen test, forty individual birds have five or more cases of broodiness against them, whilst three birds have been broody ten times each. The following are the individual records:—

Competitors.	Breed.	Jan.	Total.
LIGHT BREEDS.			
E. Chester	White Leghorns ...	144	1,384
G. Chester	Do.	123	1,205
Oaklands Poultry Farm	Do.	116	1,176
W. R. Crust	Do.	122	1,172
*G. H. Turner	Do.	100	1,160
F. W. Leney	Do.	97	1,164
W. Becker... ..	Do.	99	1,157
*J. M. Manson	Do.	71	1,149
Kelvin Poultry Farm	Do.	110	1,128
T. Taylor	Do.	103	1,111
D. Fulton	Do.	109	1,091
*A. T. Coomber	Do.	89	1,090
*J. R. Wilson	Do.	90	1,089
T. A. Pettigrove, Victoria	Do.	81	1,089
Chris. Porter	Do.	80	1,076
*J. Zahl	Do.	70	1,063
Moritz Bros., S.A.	Do.	73	1,061
Quinn's Post Poultry Farm	Do.	83	1,042
J. G. Ritcher	Do.	106	1,041
*Mrs. J. D. R. Munro	Do.	72	1,025
T. B. Hawkins	Do.	88	1,013
A. H. Padman, S.A.	Do.	79	1,006
J. L. Newton	Do.	92	1,005
*Dixie Egg Plant	Do.	70	1,005
A. Shillig	Do.	60	1,004
J. Holmes	Do.	105	988
C. Knoblauch	Do.	94	985
Mars Poultry Farm	Do.	76	979
*A. W. Bailey	Do.	77	978
Mrs. W. D. Bradburne, N.S.W.	Do.	77	976
F. Clayton, N.S.W.	Do.	69	969
Mrs. S. J. Sears	Do.	87	967
E. Cross	Do.	89	966
L. G. Innes	Do.	98	962
*T. Fanning	Do.	53	961
S. J. White	Do.	85	958
C. H. Singer	Do.	75	941
S. C. Chapman	Brown Leghorns... ..	81	935
C. P. Buchanan	White Leghorns... ..	69	930
E. A. Smith	Do.	82	916
J. Ferguson	Do.	72	913
R. Holmes	Do.	55	912

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	Jan.	Total.
LIGHT BREEDS— <i>continued.</i>			
*A. E. Walters	White Leghorns ...	75	911
Geo. Williams	Do.	62	908
Miss M. Hinze	Do.	85	907
S. Howard	Do.	55	903
Mrs. J. Carruthers	Do.	84	885
*Dr. E. C. Jennings	Do.	91	859
*C. C. Dennis	Do.	37	822
HEAVY BREEDS.			
*R. Burns	Black Orpingtons ...	113	1,272
*Mars Poultry Farm	Do.	113	1,196
W. Smith	Do.	63	1,114
E. A. Walters	Do.	65	1,101
*E. F. Dennis	Do.	94	1,065
W. S. Hanson, N.S.W.	Do.	87	1,046
F. A. Claussen	Rhode Island Reds ...	80	1,020
Mrs. J. H. Jobling, N.S.W.	Black Orpingtons ...	97	993
*E. A. Smith	Do.	82	979
H. Jobling, N.S.W.	Do.	88	966
D. Kenway	Do.	76	951
Cowan Bros., N.S.W.	Do.	72	937
P. C. McDonnell	Do.	80	934
King and Watson, N.S.W.	Do.	90	911
C. B. Bertelsmeier, S.A.	Do.	90	908
*Miss M. Hinze	Do.	92	907
*Oakland Poultry Farm	Do.	85	896
R. Burns	S. L. Wyandottes ...	81	871
J. M. Manson	Black Orpingtons ...	79	862
E. Morris	Do.	65	851
*Kelvin Poultry Farm	Plymouth Rocks ...	66	808
C. C. Dennis	White Wyandottes ...	75	804
*F. W. Leney	Rhode Island Reds ...	50	703
F. Clayton, N.S.W.	Do.	49	682
Totals	...	6,092	72,723

* Indicates that the birds are engaged in single hen test.

DETAILS OF SINGLE HEN PENS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
G. H. Turner	160	170	215	223	184	217	1,169
J. M. Manson	184	209	158	175	199	224	1,149
A. T. Coomber	178	123	213	198	198	180	1,090
J. R. Wilson	200	178	169	195	164	183	1,089
J. Zahl	205	110	215	123	215	195	1,063
Mrs. Munro	224	170	143	153	129	206	1,025
Dixie Egg Plant	158	193	178	200	85	192	1,006
A. W. Bailey	36	174	198	196	192	182	978
T. Fanning	130	172	181	146	135	197	961
A. E. Walters	120	130	152	185	153	171	911
Dr. Jennings	120	100	166	155	188	130	859
C. C. Dennis	176	89	77	154	162	164	822

EGG-LAYING COMPETITION—*continued*.
DETAILS OF SINGLE HEN PENS—*continued*.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
HEAVY BREEDS.							
R. Burns	187	162	231	170	234	288	1,272
Mars Poultry Farm	180	218	195	198	207	198	1,196
E. F. Dennis	221	196	183	231	198	36	1,065
E. A. Smith	162	166	134	188	171	158	979
Miss M. Hinze	161	136	128	162	164	156	907
Oaklands Poultry Farm... ..	204	134	125	113	197	123	896
Kelvin Poultry Farm	127	128	131	179	97	146	808
F. W. Leney	121	132	104	105	114	127	703

THE TRAP-NEST.

Mr. R. T. G. Carey, the well-known poultry-breeder of the Pindora Poultry Farm, at Beerwah, North Coast Line, sends us the following interesting and valuable information concerning the advantages of trap-nesting, which will doubtless prove useful to those of our readers who are engaged in poultry-farming. He writes:—

“ With your kind permission I thought a few lines upon trap-nesting would be suitable for readers of the *Queensland Agricultural Journal*; hence my object in penning these few lines and the remark upon the important subject of trap-nesting would not be out of place.

“ In poultrydom there are a vast number of aspirants engaged in poultry-raising. Some have made it a profession; some have failed, while others have become actual experts or scientists. Yes, poultry-breeding to-day is a scientific craft, wherein the many essential details that crop up have to be performed with the same degree of exactitude as a surgeon's work in a hospital. Care, cleanliness, attendance, rationing, watering, and coping against mites, diseases and parasites, &c., have to be all studied; hence the poultry-breeders of to-day are scientists, using the new and modern inventions of appliances for hatching, foster-mothering, fattening, and trap-nesting; the last-mentioned employment, though tedious, is essential for the betterment of poultry-farming.

“ Trap-nests reveal the doings of individual hens, the identification of 300, 200, 100, 50, or 30 egg hen become known thereby, and drones if any. They prevent the egg-eater by disclosing the culprit, thereby allowing her to be fattened for the table. The trap-nest also demonstrates which members of the flock lay large-sized eggs and likewise the percentage of infertile eggs, and the bad shape, too long or very small egg layers.

“ By the aid of the trap-nesting system, breeders can vastly improve their laying strains. It is the only certain test (far outstrikes Hogan's system, or Zarl's test, which are only presumptive problems that amateur fanciers would be wise to leave alone).

“ Trap-nesting is the only certain test, far in advance of the majority of systems of selection in points of accuracy. It is a long and trying job, a 365 every-day task throughout the year, records taken of tabs on fowls, eggs laid, &c., in all kinds of weather—wet, fine, floods, or drought.

“ As an illustration of the benefits of trap-nesting, I will quote the records of two of my pens during the month of January. Pen No. 1: Six yearling hens whose output for the month was 135 eggs, their individual record being as follows:—24, 23, 23, 22, 22, 21. No. 2 pen was composed of three hens and three pullets, their total score being 95 eggs. Of this number the hens laid 56 eggs as follows:—19, 14, 23. Two of the pullets laid an egg each on the first day of the month, and from that date to the 31st only gave 13 and 20 eggs respectively. The other did not start until the 6th, and finished by producing only half a dozen tiny eggs by the end of the month.

“ Thus, when the trap-nest is used, the good layers can be noted at a glance, and the undesirables and drones are speedily detected. Also, every egg being marked according to the leg band number of the hen that laid it, it can readily be noted which birds produce the greatest number of fertile or infertile eggs.

“ It is through this detective service branch of our business that all the not-up-to-standard egg-producers and layers of infertile eggs are culled. As a result, none but the best are retained; hence the success of breeders must follow.

“ Therefore, the detective service branch of poultry-farming is as essential for the maintenance of fruitful productions as is the detective service of our metropolitan towns for its useful work in repressing undesirables. We must thank our trap-nests for this faithful service.

UTILITY V. FANCY.

By J. BEARD, Poultry Instructor.

I have put this heading with utility first because just now the fancy is taking a back seat, but the utility side is very much to the front. No one will deny the fact that between the two sections there is a wide difference, and yet the two are inseparably connected. The utility breeder has much to thank the fancier for. You can hardly point to any new variety which was brought into being for the utility side alone, unless it is the Sussex fowl, but this has been improved wonderfully since the fancier got hold of it.

On the other hand, the fancy breeder has evolved many new varieties which to-day hold high places in the realm of utility.

For pride of place, I might mention the Orpingtons, Wyandottes, and Rhode Island Reds. These were brought out as all-round fowl, which would please the fancier, and yet do credit to the utility side because of their usefulness in producing eggs and their qualities as table fowls. These birds were first seen on the exhibition bench, and they created quite a sensation, and so popular have they become that one cannot find a town in any part of the State, and I might add the world, without seeing these birds. Some of them may be crude-looking creatures, but that is because they have been kept just for utility, without any knowledge of the show points. I am ready to admit that the type of some breeds is very different for the two sections. Take the Leghorn in its separate classes, while the

layer is a very active, business-looking fowl, that seen on the show bench is larger and longer in leg. But this same idea governs most breeds. If you want a good layer don't select the biggest, but take those of smaller size, which look like work, with a keen eye and sharp features.

I have known scores of men take up poultry-keeping for producing eggs alone, but the interest in the birds, and possibly a natural inclination, has soon made them into fanciers, who want to breed something better than they already possess. Such is the fascination of the fancy side, that when one gets a fowl, there is always the desire to have something better, and when breeding for show points the interest increases each season. When only producing eggs, the breakfast table is the first consideration, after which all interest ceases. The fancier goes on from year to year always hoping to improve. He watches the chicken from the shell, and sees its development, and wonders right through what it will turn out, whether just a killer of an exhibition winner. But the utility man is out for numbers, and the more he hatches the better he is pleased with himself; and then his only worry is, what will be the proportion of cockerels? True, that is poultry-keeping, but it is on a different plane from that of the fancier. The one is anxious for the moment, and then it is not important; but the keen fancier is interested all the way through, for after he has finished chicken-rearing there is the further development of the stock and the condition of them when fully feathered. The adult plumage is always interesting. A bird will be handled nearly every day to see how the feathers are coming, and whether the markings will be correct, or if the shade of colour is all right. To the fancier the whole year is one round of pleasure and fun of showing. One show the bird is a cup winner, and the next not a card. Then there is the curiosity to know what the judge was pleased with in the one case and what he did not like in the other.

The fancy world is not a bed of roses, but though we get pricked with the thorns we also get the scent sometimes. With so few shows about, the fancier has had a set-back, for some people have not the money to spare, and those who are now earning and would spend cannot find the time to devote to the birds. But it will all come back again; as soon as the Empire settles down, things will right themselves, and then the fancy will again thrive as it has done in the past.

All sections are needed, and if we work together for the common good, then it must be better for everyone.

It is idle to compare the prices of the two sections, for just now nothing is making very big figures; but in ordinary peace times the prominent fancier can make prices which would make the utility man's mouth water.

Last year several instances came before my notice of birds having been claimed in shows at prices ranging from £5 to £25, but this is only an ordinary amount in normal times. No doubt these were claimed with a view of winning at other shows, and if shows were plentiful this sort of thing would go on. Such sums in one lump are very useful, and the utility man would have to turn over a good many birds before he reached such amounts.

I may be pardoned for sticking up for the fancy, because I am an out-and-out fancier, but I also recognise that the two sections are needed to keep things going and supply the common needs of mankind.

LAYING STRAINS.

By J. BEARD, Poultry Instructor.

A fowl is a fowl, no matter whether it be just kept for producing eggs or whether it is capable of winning prizes at the leading shows of the State; thus some people sum up the position of poultry-keeping, and never seem to get beyond this idea. My friends all know that for over thirty years I have been a great exhibitor and won prizes at all the best shows in the State, so when dealing with this branch of the business I must be given the credit of knowing what's what.

The fancy side has many charms which the pure utility man knows nothing about, for the one is producing a fowl because it lays eggs while the other is breeding a bird for its beauty and what it is likely to do on the exhibition bench. Still, says the novice, all are fowls. But beyond all this there is much that both sections have done to improve their stock. While the one has gone in for beauty of plumage, brilliant colouring, and striking markings, the other has turned his

attention to seeing how many eggs he can get from each fowl, and, while his average one year may be only 120 per head, he looks forward to the time when this will reach 150; thus, to a very large extent both are working on pedigree, but with rather different ideas in view. Yet pedigree has made the industry what it is to-day. The best laying White Leghorn was not a freak found in an odd corner somewhere, but has been the result of careful mating for some years past. A stock of layers could be produced from almost any breed if the owner would care to go to the trouble. No one recommends the Indian Game as the ideal laying fowl, but in taking any six pullets of this variety some will lay better than others, and if these were persisted with, and the same idea followed of only breeding from the best layers, it would be possible to get a good supply of eggs even from the much-maligned Indian.

This is the principle which has been at the back of the Orpingtons, Wyandottes, Leghorns, and Rhode Island Reds, and brought some of these strains up to such a perfection as regards laying. Even in these one might get a flock of birds which would turn out very moderate or even poor layers. It is more a question of strain or that which is very like the pedigree, because not all are bred with the same care and accuracy. You could easily have two shorthorn cows, both nice to look at, but one will give nearly as much milk again as the other simply because she has been bred from a milking strain, and her pedigree warrants the assertion that she would turn out a good milker. The production of pedigree layers is worked out on very similar lines. One cannot breed from anything called a Leghorn and expect good results. An expert knows the difference between a good and bad layer at a glance, but there should be at the back of this the knowledge of what strain the stock is, then the thought is more convincing. I have very carefully followed the different habits of some of the same breed, and, just as there are drones in the beehive, so there are lazy fowls in the run. No two birds are exactly alike. One will be always busy looking out for any tit-bit about, and if on a paddock or run will soon eat its ordinary food and then be off to see what it can find.

The other will be always round the trough to pick up the last grain, and then may wander round to see what is about, but by this time the other bird will have caught the early worm. While the latter fowl may lay a fair share of eggs and do her part, it is the active little hen which is going to do a bit more than her share and earn you the extra profit which is to come in useful.

To breed from all fowls haphazard without considering what they have done is fatal, but the best layers should always be used for reproduction, though as soon as you do this you are building up a pedigree. If you would make sure of the number of eggs laid by each bird, the trap-nest or the single penning system is the only safeguard, for then it is easy to follow the weekly or monthly returns of each hen, and is a safe guide for next year's mating. One often unconsciously raises a strain of layers and builds up a pedigree without any special method, but there is usually a keen insight into the character of the birds, so that when mating up only the best layers are used.

Some breeders are quicker at discerning differences in hens than others. I have known people keep fowls for years, and though they get a certain number of eggs per day they could not tell you which birds laid the different eggs, nor even which ones were laying. Much can be done by ordinary observation, and anyone greatly interested in the industry will naturally find out things which another person would never see, and yet this does not imply lack of keenness to make headway. One has a natural aptitude for picking up things, and is able to grasp the conditions quicker than another; and, though the dull one may get there eventually, the other has seen through the position and made headway. Good laying fowls are bred on pedigree lines, and are not found easily from an ordinary stock at random.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RETURNS OF COWS FROM 27TH DECEMBER, 1917, TO 26TH JANUARY, 1918.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%.	Lb.	
Lady Margaret ...	Ayrshire ...	28 Dec., 1917	829	5.1	49.74	
College Bluebell ...	Jersey ...	28 June "	682	5.2	41.02	
Iron Plate ...	" ...	4 Oct. "	752	4.5	39.70	
Miss Edition ...	" ...	12 Nov. "	810	4.1	38.40	
College St. Margaret	" ...	9 Nov. "	604	5.3	37.25	
Miss Bell ...	" ...	27 June "	594	5.3	36.85	
Sweet Meadows ...	" ...	8 Aug. "	558	5.7	36.83	
Jeannie ...	Ayrshire ...	13 Dec. "	841	3.8	36.74	
Leading Lady ...	Jersey ...	26 Dec. "	755	4.2	36.64	
Hedge's Dutchmaid	Holstein ...	7 Sept. "	757	4.1	35.73	
Miss Edith ...	Jersey ...	23 Dec. "	696	4.8	33.83	
College Damsel ...	Holstein ...	12 July "	733	4.0	33.77	
Lady Annette ...	Ayrshire ...	19 Oct. "	649	4.4	33.46	
Buttercup ...	Shorthorn ...	2 June "	706	4.1	33.28	
Nina ...	" ...	6 Sept. "	775	3.7	33.21	
Auntie's Lass ...	Ayrshire ...	5 July "	826	3.5	33.04	
Netherton Belle ...	" ...	17 July "	675	4.0	31.43	
Netherhall Queen	" ...	30 June "	767	3.5	30.68	
Kate						
La Hurette Hope	Jersey ...	22 Aug. "	511	5.2	30.66	
Lady Loch II. ...	Ayrshire ...	3 June "	615	4.3	30.64	
Miss Betty ...	Jersey ...	27 Mar. "	520	5.0	30.10	
Comedienne ...	" ...	13 Dec. "	554	4.6	29.91	
Burlesque ...	" ...	8 Oct. "	496	5.2	29.86	
Lady Dorset ...	Ayrshire ...	14 Aug. "	619	4.2	29.84	
College Mermaid ...	Jersey ...	21 Aug. "	492	5.1	29.52	
Glade ...	Shorthorn ...	29 Mar. "	464	5.3	28.95	
College Ma Petite	Jersey ...	10 Nov. "	621	4.0	28.94	
Skylark ...	Ayrshire ...	24 May "	576	4.3	28.79	
Violette's Peer's Girl	Jersey ...	27 June "	566	4.4	28.41	
Songstress ...	Ayrshire ...	1 Oct. "	589	4.1	28.23	
Leonie ...	" ...	4 Sept. "	602	4.1	28.09	
Lilia ...	" ...	11 July "	644	3.7	27.87	
Thornton Fairetta	Jersey ...	30 June "	418	5.4	26.11	
College Cold Iron	" ...	7 Dec. "	562	4.0	25.89	
Glow VI. ...	Guernsey ...	9 Nov. "	668	3.3	25.60	
Miss Security ...	Ayrshire ...	27 Mar. "	531	4.1	25.44	
Princess Kate ...	" ...	28 June "	506	4.3	25.30	
Lerida II. ...	" ...	2 June "	472	4.5	24.80	
Confidence ...	" ...	25 June "	587	3.7	24.70	
Charity ...	Jersey ...	26 June "	362	5.8	24.23	
Lady Mitchell ...	Holstein ...	30 Sept. "	574	3.6	24.06	
Lady Doris ...	Ayrshire ...	2 April "	471	4.2	22.44	
Rosine ...	" ...	21 June "	591	3.3	22.43	

The Orchard.

STRAWBERRY CULTURE.

By ALBERT H. BENSON, M.R.A.C., Director of Fruit Culture.

As inquiries are received from time to time by the Department of Agriculture respecting strawberry culture, and as I have written nothing pertaining to this subject since my work "The Fruits of Queensland" was published in 1907, it is deemed advisable to revise what I then wrote, particularly as that publication was written more for the purpose of giving information on Queensland fruitgrowing in general, rather than specialising on any particular fruit or fruits.

THE SUITABILITY OF QUEENSLAND FOR STRAWBERRY CULTURE.

Although the strawberry is commonly considered to be better adapted to the climate of the temperate zone than to that of the semi-tropics, it is, nevertheless, the one berry fruit which can be grown to perfection in this State. Excellent fruit is produced in our Southern coastal districts and even under tropical conditions such as those existing at Townsville, when the plants are grown on alluvial soil and are well irrigated. This shows that the strawberry has a wide range in this State and that it can be grown successfully over the greater portion of our Eastern coastline and the tableland country adjacent thereto, provided there is either an adequate rainfall or, failing that, a supply of water for irrigation.

The commercial cultivation of the strawberry is, however, confined mainly to those districts possessing a regular rainfall, and extends from the Redlands Area in the South to Bundaberg in the North. When grown under suitable conditions in this district, the strawberry has proved itself to be an early and prolific bearer, able to stand a fair amount of hardship, in the shape of dry weather, and to resist the attack of insect and fungus pests to a greater or less extent.

There is a good demand for the fruit, either for immediate consumption in this and the Southern States or for conversion into jam, and, as few crops yield a quicker return, it frequently enables a beginner to make a living whilst more slowly maturing fruit crops are coming into bearing. Many a pioneer fruitgrower has to thank the strawberry for his start, as it enabled him to make a living where he would, in all probability, have failed otherwise, and what applied in the case of our pioneers still holds good with the beginners of to-day.

Many of our strawberries are of excellent quality and carry well, so that they reach their destination in the Southern States in good order when carefully handled and packed, provided the weather is not excessively warm or the fruit over soft on account of excessive rainfall. For jam purposes the fruit is excellent, and the product of some of our local factories is not excelled elsewhere in the Commonwealth.

SOILS FOR STRAWBERRIES.

Given suitable climatic conditions, strawberries will thrive in most soils, but the ideal soil for this fruit is a rich loam of medium texture, well supplied with humus, possessing perfect natural drainage, and capable of retaining moisture during dry spells—and the nearer one can get the soil to this ideal the better the results. Heavy, cold, badly-drained subsoils are not suitable, but any good loam or sandy loam, whether of scrub or forest origin, can be made to produce good berries if properly treated.

PREPARATION OF THE SOIL.

There is only one way to prepare soil for strawberry culture, and that is, *thoroughly*. Nothing else will do. In the case of virgin scrub or forest land, which is, as a rule, fairly rich in humus, the land, after it is cleared, should be broken up deeply and brought into a state of as nearly perfect tilth as possible. On virgin soil, except it is of the poorest nature, it is not necessary to apply any manure for the first crop, as there is usually an ample supply of available plant-food and humus present in such soil, but for subsequent crops, or old land, systematic manuring is very important. Old land that is at all deficient in humus should have that deficiency made good, either by the application of a heavy dressing of farmyard or stable manure, such as a load to every 4 perches, or if this cannot be obtained, then by growing a green crop such as cowpeas or other legume which has been well manured with phosphatic and potassic manures and ploughing it in. The green crop so ploughed in should be allowed to rot and, when rotten, the land should be reploughed and worked down fine. If the green crop has received a generous dressing of phosphatic and potassic manure, then there will be no need to apply any further fertilising material to the land, as a complete manuring has been given; but if not, then the soil should be treated as recommended later on.

The surface of the land should be kept as even and level as possible, and, as already stated, it should be worked down fine, so that when the young plants are set out they will take hold of the soil at once and become firmly established.

Planting strawberries on raw land, sour land, or land that has been indifferently prepared, is only courting failure, whereas, when the planting is carried out as advised, there is every chance of success.

SELECTION OF PLANTS.

Always obtain strong runners from healthy, prolific plants. The first runners next to the parent plants are to be preferred, as they are usually the most vigorous and best rooted, and, further, they come into bearing earlier; but, failing these, any well-rooted, strong, well-grown runners can be used, and although they will not fruit as soon as the first runners they will give a good yield later on, and frequently continue to bear when the earlier fruiting plants have ceased.

PLANTING.

Having secured suitable plants, trim the straggling roots with a sharp knife and plant as shown in the illustrations herewith, which are



No. 1.



No. 2.



No. 3.



No. 4.

self-explanatory. Careless planting is responsible for many failures, especially too deep planting, as no strawberry will thrive if its crown is buried under the soil.

The distance at which to set out the plants varies somewhat in different districts, but it is not advisable in any case to overcrowd the plants, but to allow plenty of room. Personally, I favour planting strong plants at from 20 in. to 2 ft. apart each way, so that when planted the land can be worked all round the plant; or if row planting is desired, then the rows should be about 30 in. apart and the plants set out at from 15 to 18 in. apart in the row. The illustration of a strawberry garden at Mooloolah shows the manner of planting adopted by one of our most successful growers, and it will be noted that the plants have plenty of room and are in no way overcrowded.

CULTIVATION.

Strawberry plants must only be surface-worked whilst growing or bearing fruit. The object is to keep down weed growth and to prevent the surface of the soil caking; but the cultivation must never be so deep that it will injure the roots. The best implement to use is the Planet Junior hand cultivator or similar machine; or, failing that, a good Dutch hoe of any type that may be preferred.

Weed growth must be kept down and the surface of the soil must not be allowed to become hard and set.



If the plants are to be kept over for a second or third year, then the whole of the runners, other than those required to make good any losses in the original plants, must be removed, and the ground between the original plants must be well broken up and manured in late summer or early autumn, so that the plants will be in good nick for producing the following season's crop of fruit.

If the plants have been badly attacked by leaf blight it is a good plan to cut off all the leaves and burn them prior to working and manuring the land, as numerous fungus spores are destroyed thereby. The burning off is best done by scattering a little loose dry straw over the plants when the leaves have been cut off and have dried, and then setting fire to the lot. A light burning does not injure the plants, but is decidedly beneficial.

MULCHING.

This is seldom practical in this State, and it is of very doubtful value under our local conditions, a light surface soil mulch, such as that produced by working the land with a Dutch hoe or Planet Junior hand cultivator, being all that is necessary.

MANURING.

The strawberry is a fruit that requires an abundance of readily available plant-food, and one that pays well for systematic and judicious manuring. In the 1917 edition of his pamphlet, "Complete Fertilisers for Farm and Orchard," the Agricultural Chemist to this Department gives the following advice, which it will pay to follow:—

"Some of our coastal country, between the 26th and 28th degrees south latitude, is particularly suitable for strawberry culture, frequently producing quite phenomenal crops. Some of our rich loamy soils found in our coastal scrub lands give the best results. In poorer sandy soils the improvement effected by artificial fertilisers, particularly such containing potash, is very marked.

A complete fertiliser for strawberries should contain 7 to 8 per cent. phosphoric acid (water soluble), 8 to 10 per cent. of potash, and 3 per cent. of nitrogen, and should be used at the rate of 5 to 9 cwt. per acre.

The following fertiliser mixture may be found useful:—

3 to 5 cwt. basic or ordinary superphosphate	} per acre;
1½ to 2 cwt. sulphate of potash	
1 to 1½ cwt. sulphate of ammonia, or nitrolim,	
or nitrate of soda	

or,

1 cwt. fine bonemeal	} per acre;
4 cwt. superphosphate or basic superphosphate	
2 cwt. sulphate of potash	
1½ to 2 cwt. nitrate of soda	

the latter applied by two or three top-dressings, at the rate of 1 cwt. per acre, when fruit is first forming, and thereafter at intervals of 2 weeks."

MARKETING.

Fruit for immediate consumption should be gathered whilst still quite firm. It should be carefully handled and packed in boxes or trays containing a single layer of fruit. The use of punnets is not so satisfactory, as the fruit is more likely to be bruised, and it is doubtful if the methods of marketing the fruit in single layers can well be improved upon. Fruit for factory use is stemmed, placed in casks or other suitable receptacles, and forwarded as quickly as possible to the factory. Care in handling, picking, grading, or packing, always pays.

DISEASES.

The most serious diseases of the strawberry in this State are those of fungus origin—viz., leaf blight and mildew.

The former can be controlled by the use of Bordeaux or Burgundy mixture applied as a spray, combined with the burning off of affected leaves, as previously mentioned; and the latter can be kept in check by means of sulphur applied in a similar manner to that employed for the treatment of oidium in grapes, or by spraying with sodium or potassium sulphide or a weak solution of lime sulphur. Insect pests seldom do any very serious injury, but when leaf-eating beetles or other leaf-eating insects are present they can easily be destroyed by spraying with arsenate of lead.

VARIETIES.

Although most of the standard varieties of strawberries have been grown in Queensland at one time or another, experience has shown that no one variety has proved permanent, but that it has been necessary to either raise new kinds from seed or to introduce them from elsewhere. Varieties producing perfect flowers have proved more profitable than pistillate sorts and are therefore most commonly met with.

After being grown in this State for a few years most varieties become weaker in growth, more liable to disease, and less prolific, so that they have to be discarded. The introduction of new sorts is thus essential, and there is no better way of doing this than by raising local seedlings. Some of the best sorts ever grown in the State have been locally raised seedlings, of which the *Auric Anetta* and *Phenomenal* are good examples, and there is no reason why sorts equal or even superior to these should not be produced. Of the well-known standard varieties, such as *Marguerite*, *Trollop's Victoria*, *British Queen*, *Pink's Prolific*, *Federation*, *Melba*, and *Edith*, and several others that have been grown from time to time in this State, few are now planted, and those kinds that are now being grown, such as *Phenomenal*, *Usher's Special*, and *Auric*, will probably be replaced by newly raised seedlings in course of a few years. The type of strawberry best suited to this State is a vigorous healthy grower—that is, a good bearer and producer of good coloured fruit of good, firm texture and fine flavour; a fruit that keeps and carries well, and that meets the requirements of both the fresh fruit trade and of the jam maker.

ORANGE-GROWING AT CAIRNS.

Mr. Ben Mills, of Freshwater, near Cairns, has made a speciality of growing Navel oranges in his citrus orchard, and apparently has been very successful in the business. He has 13 acres under this variety of the citrus family, on which a thousand Washington Navel trees are thriving, and which are now from four to five years old. No. 1 photo. represents a general view of the orchard, and in No. 2 is depicted one of the five-year-old trees. The oranges on the box were picked on New Year's Day, and

each fruit measures $3\frac{3}{4}$ in. in diameter. There is only a small crop this year, as the trees are rather young. We wish Mr. Mills every success, as he is in the right locality for citrus culture, and has wisely chosen a most valuable and marketable variety for export.



PLATE 7.—GENERAL VIEW OF ORCHARD.



PLATE 8.—FIVE-YEAR OLD TREE.

Viticulture.

HINTS TO GRAPEGROWERS.

By C. A. GATTINO.

(Continued from February, 1918.)

SUMMER PRUNING.

This is a systematic operation, just as is the winter pruning; however, it is not sufficiently understood, and enough importance is not given to it by grapegrowers. For the better guidance of my readers, I will describe this operation in its several phases, starting with the most important.

Green Pruning.—This is the main practice, and has to be performed when the shoots are about 6 or 8 in. long, when all the small buttons or bunches can be plainly seen. The main principle of this practice consists in pinching off the barren shoots growing on the fruit-bearing branch; also all the young shoots growing on the main stem below the first fruit-bearing branch. The development of such barren shoots is not only useless, but is detrimental to the fruitful ones. By pinching them off, we not only encourage the useful growth of the plant, but lead the sap into those channels where it will benefit the development of the young bunches and the wood destined to be fruit-bearing next year.

The *pinching back* of the fruit-bearing branches, so as to prevent an excessive and useless lengthening, is a good practice for concentrating all the sap into the bunches of fruit. These branches can be pinched back to within two leaves if the shoot bears more than one bunch, and to four leaves if it only bears one. The pinching back also is effective to spurs designed to be fruit-bearing the following year. Their growth may be stopped when they are about 3 ft. long. This stoppage of growth will concentrate all the vigour into producing a strong, healthy wood for the next season's crop.

The *stripping off* of the leaves is a very useful operation, especially when the autumn temperature is very low; it would, however, be dangerous in very warm climates. This operation consists in stripping off the leaves near the bunches, and thus allowing the beneficial action of the air and light on the fruit. The time for stripping is when the leaves turn yellow, that being a sign that they have ceased to function. If time and labour are available, I would recommend that any suckers that may have grown since the first pinching off be also pinched back, as they will only develop into useless shoots.

[TO BE CONTINUED.]

Forestry.

KILLING GREEN TIMBER WITH ARSENIC.

Of late we have had many inquiries from our subscribers and others interested in clearing land expeditiously as to the method of destruction of trees by means of arsenic, and of dead stumps by acids. We are pleased to be able to give clear directions on the matter. The "Farm Bulletin" for January, 1918, published the following paper on the subject, by C. W. Burrows, Assistant Inspector of Agriculture, New South Wales, which comes at a most appropriate time:—

In this country, where large areas of land are available for occupation, and are heavily timbered, it is of primary importance to remove the timber, either wholly or in part, in order to increase the productivity of the land, and the quickest means is usually the best.

Ordinary ringbarking is effective if done at the right time for the particular district, for it must be conceded that seasons vary considerably from year to year, making the operation an adjustable one. But ordinary ringbarking has one disadvantage—it is slow, often taking twelve to eighteen months before the trees can be burnt off.

Of late years, the action of arsenic has been introduced with marked success in hastening the killing by the ringbarking process, and trees that ordinarily would take months to kill by the old method are now killed in a few weeks, and frequently in a few days, by the application of arsenic.

Arsenic—the ordinary white arsenious oxide of commerce—costing about £1 6s. per cwt., is not soluble in water to any great extent, so that soda, either the ordinary washing soda at about 5s. per cwt. or caustic soda at about £1 8s. per cwt. has to be used in conjunction with it, in order to make it soluble.

Should the ordinary washing soda be used, the proportion should be three of soda to one of arsenic, and boiling is necessary to bring about complete solubility. If using caustic soda, the proportion of which is two of caustic soda to one of arsenic, the mere addition of water in reasonable quantity generates enormous heat, doing away with the necessity of boiling for the dissolving of the arsenic.

When large amounts of the solution are required, washing soda will be the cheaper, but for small quantities of solution, caustic soda will possibly be found the handiest, as boiling is unnecessary.

In dissolving the arsenic, whether for washing or caustic soda solution, there is one point worth remembering: Do not tip the whole of the arsenic into the solution in a dry state, but mix it to a paste slowly and carefully, in the same way as the housewife treats her cornflour, then pour it slowly into the soda solution, stirring it all the time, and be careful to stand on the side away from the fumes, as they are poisonous. When once the soda and arsenic are dissolved and chemically combined the bulk may be made up to the required dilution by the addition of water.

A useful strength for quick and effective work in all kinds of timber is as follows:—

Arsenic, 1 lb.
Washing soda, 3 lb.; or caustic soda, 2 lb.
Water, 4 gallons.
Whiting, $\frac{1}{2}$ lb.

The addition of this whiting is merely that it may serve as an indicator on trees treated, as it turns white on slightly drying, making it quite certain what trees have been operated on. An empty kerosene tin makes a useful measure for dissolving, as it holds 4 gallons.

The time to carry out the work of poisoning is when the tree is dormant—that is, when the sap movement is at its minimum and the sap right down in the roots and lower portion of the trunk. This occurs in the winter months from, say, March to July, according to the district, and must necessarily vary between these limits in a State like New South Wales which embraces such a wide variation of climate. On parts of the North Coast ringbarking has been carried out to the best advantage as late as June and early in July in certain years, whereas in the most central parts of the State, late February and March have found the sap movements at their lowest.

The main object in catching the sap to season is to prevent suckering. Trees can be killed by arsenic or ringbarking at practically any time of the year, but to prevent this suckering it is highly important to operate when the sap is down, or **just** completing its downward course.

Having decided on the season and dissolved the poison, we are ready to "frill" the trees. By "frilling" is meant a succession of downwards axe cuts completely round the tree, and each cut well **overlapping** the adjoining ones so as to leave no unsevered section of bark up which the sap can flow. There is no doubt that "frilling" alone would kill timber if allowed time, but the poison **does it in a** fraction of the time; in fact, trees have been killed in a few days. These cuts must be through the bark and well into the wood proper, and as close down to the ground as is convenient to cut them consistent with the shape of tree, say, from 6 to 10 in. up.

For trees of 4 ft. diameter about a quart of solution is poured into this frilling, right round the tree, using an old teapot or kettle, as the spout makes pouring easy and less is wasted by spilling needlessly round about. Smaller trees naturally need less solution.

Saplings may be cut off low down, and with a swab-stick the solution may be dabbed on to kill and prevent suckering.

It is very important that this frilling and the applying of the poison be consistently and thoroughly carried out, and not in any way scamped or slummed, if good results are to be looked for.

There need be no fear about stock being poisoned by eating the fallen or dead leaves from poisoned trees; for when is considered the comparatively small quantity of solution used, the likelihood of the leaves absorbing any free arsenic is very remote.

Nor is there much danger from stock grazing on areas frilled and poisoned, though it would be desirable to keep all stock off for three or four weeks, when all possible chance of danger would have disappeared.

At the time of writing the prices of materials for cwt. lots are:—

Caustic soda, £1 8s. per cwt.
Washing soda, 5s. 6d. per cwt.
Arsenic (grey), £1 4s. per cwt.
Arsenic (white), £1 6s. per cwt.

Prices are somewhat inflated at the present time, and, of course, a slight increase on the figures quoted will have to be paid for smaller quantities.

Although arsenite of soda is obtainable as such from drug merchants (the price quoted being £2 2s. per cwt.), its use in that form cannot be recommended for the poisoning of green timber, as it is not a definite chemical compound, and its content of arsenic and soda varies in accordance with the methods of manufacture.

The cost of the work will differ considerably in different districts. It is worthy of mention, however, that a recent report of the Manager of the new Condobolin Demonstration Farm records that poisoning was adopted there with success and economy. The work was done by day labour at a total cost of 1s. 5d. per acre. This must be considered very low, as the country was fairly heavily timbered, and the wages paid were from 1s. to 1s. 4½d. per hour. Said the manager: "The timber has all died, and mostly within forty-eight hours from the time of ringing." The liquid was distributed by means of 1½-gallon watering-cans with spouts made specially long, and having exit holes of about the size of a No. 8 wire.

DESTROYING STUMPS WITH ACIDS.

An impression has persisted among farmers for many years that tough stumps can be got rid of, or at least rotted so that they will burn freely, by treating them with some strong acid, such as sulphuric or nitric acid, and waiting a few weeks. In order to test the matter properly, a series of experiments was designed by Mr. F. B. Guthrie, chemist, in 1913, and deep auger-holes were bored in selected stumps of tough timbers, some green and some dry. Quantities of the chemicals named, separately and together in varying proportions, were poured into different stumps. The results were noted regularly for six months, at the end of which time an examination showed that in the case of both green and dry stumps the acid had no appreciable effect. The average cost per stump worked out at 1s. 9d., which included labour at the rate of 7s. per day; it is an open question whether men could be found who would use two such dangerous acids at that figure.

Saltpetre has also been said to be useful in preparing dead timber for burning off, but numerous private experiments go to disprove the theory.

Entomology.

CANE GRUB INVESTIGATION.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report upon Cane Grub Investigation from Dr. J. F. Illingworth and Mr. E. Jarvis:—

The flight of the grey-back beetles, though long drawn out, has been comparatively small this year in the region about Meringa Station. A few beetles are still emerging (14th January) and are to be found on the feeding trees, nearly two and a-half months after the first emergence in November. We are already finding second-stage grubs of this species in the field, resulting from these earlier emergences.

DESTRUCTION OF FEEDING-TREES.

As pointed out in the publications from this office, the grey-back beetles show a decided preference for feeding upon the foliage of the Moreton Bay ash. Since these trees are commonly distributed through the forest and often in the vicinity of grub-infested canefields, it would appear to be a profitable procedure to have them all cut out within a circumference of about a mile of such fields. Moreover, these trees also appear to be the favourite food-plant of both *Lepidiota frenchi* and *L. rothel*. In the region immediately around Meringa, all of these beetles appear to travel about half a-mile back into the forest, though no doubt they would travel double this distance if feeding-trees were scarce. There is also the possibility that beetles forced thus far from their breeding-ground to feed would not be likely to return to the canefield to lay their eggs, but would probably place them at the roots of native grasses in the forest, as they did before sugar-cane was introduced.

TRAP-TREES.

It might be well to keep a few trap-trees about the buildings on each farm, so that the beetles could be shaken off each morning for the fowls. We have found the weeping fig work well for this purpose, for it is usually covered with beetles every morning. The fowls feed very greedily upon the fresh beetles, with no ill effects, though they do not seem to care so much for them when dried and ground up into a meal. Of course, the natural instinct is to break up the insects themselves. The cases reported of poisoning fowls by feeding them collected beetles were evidently the result of letting the insects stand too long before they were used; hence, decay had set in and ptomaine poisons developed. Beetles to be used for food of birds and so forth should be quickly dried, and in this form they might be an important article of diet for both fowls and insectivorous animals and so on in public gardens. We have had a call for this kind of food during the last two years from zoological gardens.

LEPIDIOTA FRENCHI AND ROTHEI.

Both these beetles are still much in evidence; the mating pairs hanging on the low bushes every evening indicating that they are still emerging. After mating they feed for several days before they are ready to deposit their eggs.

In the fields, mentioned in the last report, infested with *frenchi* grubs, conditions have improved since the continuous heavy rains; the cane is greener and in some cases throwing out fresh roots. Extensive digging shows that the number of grubs is materially less and that many of them have been killed in the soil, for we often find them decayed or, if near the surface, dried up. Of course, many are carried away by ants soon after they die. Since these fields have been literally swarming with the parasitic wasps for a month or more, we naturally conclude that they have been responsible for much of this mortality among the grubs.

Experiments with poisons in this same field proved very encouraging. Arsenate of soda mixed with megass and applied in a furrow along the sides of infested stools apparently killed all the grubs, for none were to be found in the treated section three weeks after application, though they continued abundant in the remainder of the row, an average of three being found under each stool.

Experiments with repellents, on the other hand, have given but negative results. Creosote sprayed on megass and placed in furrows alongside the stools failed to retard the grubs, though the odour was very strong in the soil after three weeks. Furthermore, any roots that came in contact with the creosote fumes were killed, and the plants showed a decided yellowing.

BREEDING OF PARASITES.

Breeding experiments with regard to Scoliid parasites are being attended with marked success, and at present we are working out the life-history and metamorphosis of our two most useful species of digger-wasps—*Dielis formosus* and *Campsomeres radula*.

A specimen of the latter insect that was captured in a canefield at Meringa last September lived for seventy-five days in confinement, during which period it laid twenty-five eggs upon third-stage grubs of *Lepidiota frenchi*.

A single egg is laid on each grub and hatched after an interval of about three days, when the tiny larva at once buries its head in the body of the paralysed grub and proceeds to imbibe its juices.

So rapidly does it develop at this stage that nine days later those destined to produce female wasps have become plump white maggots nearly an inch in length and have ceased feeding.

Larvae of male wasps, although much smaller than those of the opposite sex, take just as long to mature. The shortest periods recorded by us, however, are seven days for the male and eight for the female; while nine days appears to be the average time for both sexes.

Having withdrawn its head from the shrunken, distorted body of its victim, the maggot, after resting a few hours, spins an oval, parchment-like cocoon of tough brown silk, in which it gradually changes to a pupa and finally into the perfect wasp, which escapes by breaking through a circular trap-door forming one end of the cocoon.

The average time passed in the pupal stage is thirty-six days for the male and thirty-nine for the female wasps.

We have found that *C. radula* will deposit eggs upon second-stage grubs of the grey-back beetle, but apparently will not oviposit on third-stage grubs of *Dasygnathus australis* or even paralyse them.

Data obtained recently at Meringa would lead us to suppose that this digger-wasp plays an important part in the control of *L. frenchi*.

At the present time individual females bred from cocoons at the insectary are laying two to three eggs per day. A single wasp of the above species was confined with six large grubs of *frenchi* in a cage containing 72 cubic in. of soil, and when examined twenty-four hours later two grubs had eggs on them, two were paralysed, and the remainder killed.

On the preceding day, however, the same wasp paralysed twelve grubs, laying an egg upon one; she left only three uninjured of the original fifteen placed into the cage.

Upon several occasions during early morning after rain we have observed great numbers of male wasps of *C. radula* and *D. formosus* flying energetically over the surface of land supporting young cane plants injured in places by larvae of *frenchi*. Few or no females were noticed on the wing at such times, but upon digging beneath affected stools several were unearthed together, with grubs they had paralysed.

We may therefore conclude that, although not much in evidence above ground, the females, nevertheless, are usually well represented in the field.

Such conclusion is amply borne out by our laboratory tests, since out of eighteen wasps of this species—obtained from eggs laid by a female caught at Meringa on 26th September—nine proved to be males and the same number females, and all of these parasites emerged practically together.

The male wasps have a habit of congregating in numbers at sundown, particularly during wet weather; and pass the night resting, side by side, on dead twigs, so that on certain spots one can easily collect them by handfuls.

Zoology.

A RARE MARSUPIAL.

BY HEBER A. LONGMAN (Queensland Museum).

There are a number of small marsupials which are often spoken of as pouched mice or pouched rats. These belong to the same family as the well-known "native cat" or "tiger cat," *Dasyurus maculatus*, the family name being *Dasyurida*. They are mostly very small animals, and some of the species are very uncommon. The pouch is quite unlike the large purse-like structure of the kangaroo, and is merely a circular pit, being more prominent at breeding time. Most of the species have eight mammae or teats. The young are born in a very immature state, and subsequently they are attached to the mammae in the pouch area. Through the kindness of Mr. Henry Tryon, the Queensland Museum recently received two specimens of what is probably the rarest of these pouched mice—*Sminthopsis virginia*. These were found in scrub land, at Hampden, near Mackay, by Mr. W. A. Hussell, and were forwarded by Mr. W. Macartney. The species was first described in 1847 by De Tarragon, a French scientist, but his type is now lost. In 1883, Dr. Lumholtz found a single specimen, which was dug out of the ground at Herbert Vale, North Queensland. This is now in the Christiana Museum, and was the only example in any scientific institution until Mr. Tryon obtained these recent ones from Mackay. The plate which illustrates this article is a reproduction of Lumholtz's specimen, which appeared in the "Proceedings of the Zoological Society of London." The animal is blackish, grizzled with silver-white, and the head is reddish-grey, with a black stripe from nose to between the ears, and trace of another on the side of the snout. The head and body are about 5 in. long, the length of the tail being about the same.

Sminthopsis virginia has no less than forty-six teeth, and is thus readily distinguished from an ordinary true rat or mouse, in which there are only sixteen. The canine teeth are remarkably long for the size of the head. The other proportions of the animal may be gauged from the illustration.

Although this little marsupial is so rare, certain other species of *Sminthopsis* and *Phascologale* (an allied genus) are not infrequently found. A specimen of the smallest of these, *Phascologale minutissima*, was recently forwarded alive, with six young, from the Pittsworth district, by Mr. P. M. Bayley, M.L.A. The mother and her family could be accommodated within an ordinary fowl's egg-shell.

During the few days in which the mother remained alive in the Museum she accounted for a surprising number of cockroaches and beetles which were given to her. The young were just old enough to leave their mother occasionally, and they would also cling at times to the fur on her back, holding on by the mouth whilst she scrambled about. Unfortunately they all died within a week.

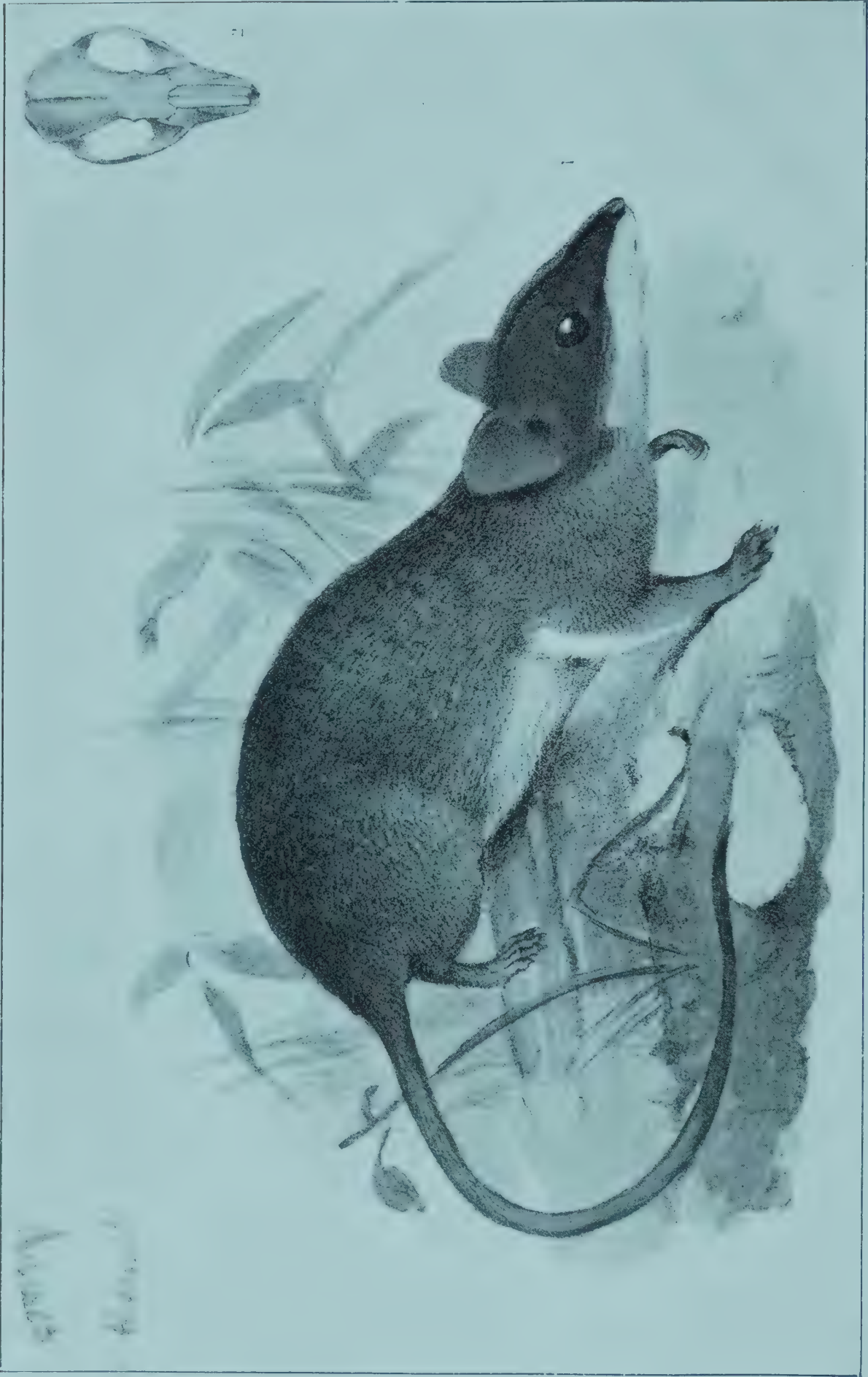


PLATE 9.—SMINTHOPSIS VIRGINIÆ, De Tar. (A POUCHED MOUSE.)

So long ago as 1896, Mr. H. Tryon pointed out, in the annual report of the Agricultural Department, that these pouched mice are of economic interest because of their insect-eating habits. He also suggested that if the common species could be bred in captivity, and liberated in numbers, they might even serve as valuable allies in the campaign against the cane-grub. Anyone who has noted the large appetites of these marsupials in captivity will realise that there is some ground for Mr. Tryon's remarks, but it seems doubtful whether successful breeding could be carried on, and in their wild state they are probably preyed upon by a number of enemies.

The largest species of *Phascologale* is the so-called brush-tailed pouched rat, the head and body of which are about 10 in. in length. The tail is long and thick, with a terminal brush. This marsupial apparently feeds on small birds and mammals, and is also accused of destroying poultry. Certain other species have curious enlarged tails, which probably contain reserve fats.

The species of *Sminthopsis* may be characteristically distinguished from those of *Phascologale* by the possession of very slender and delicate feet.

PRICKLY-PEAR AS A FODDER.

By R. J. O'SULLIVAN.

The following paper on the feeding of stock on prickly-pear was published some time ago in this Journal, and attracted considerable attention, but we have not of late heard of any general adoption of the methods here given.

"Re the above, I have pleasure in relating my experience, which, although only on a small scale, will prove that the prickly-pear is excellent for feeding cattle, and has the additional merit of being cheap. In the beginning of the big drought of 1902-3 I was living at Corinda, and a friend of mine, who is a surveyor in the Railway Department, suggested that we try prickly-pear for feeding our cows. I agreed, and we got two of the local men to join in with us. We got a truckload of pear, as we wanted it, by rail from Nudgee, and divided it between us. To feed my cow, the course I adopted was as follows:—I put as much pear as I could cram into a kerosene tin and then filled the tin with water; I then put the tin on the stove, and after allowing the water to simmer for a couple of hours I poured the liquid into another kerosene tin which contained about a quart of bran and one-third of a tin of lucerne chaff. Next morning I gave this to my cow, with the leaves, which were boiled, and although I experienced some trouble in inducing my cow to taste it, still once she tasted it she ate it afterwards most willingly. When I first started I used to cut off the big spikes, but I found some I overlooked, and which after being boiled were quite soft. After that I boiled spikes and all. I gave a similar feed every evening. My share of the pear lasted me over a month, and I am certain it did not cost me 10s. for the pear I used. I particularly noticed that—although I doubled the quantity of lucerne when I ran out of the pear—if I had to wait a week or so for the fresh supply my cow fell away in the milk, and came up again when I returned to the pear. A gentleman whom I casually met in the train informed me that he was feeding quite a number of cows on boiled prickly-pear; but, as he believed it would form a ball in the stomach, he intended selling them when the drought was over. With regard to the 'ball in the stomach' theory I am quite satisfied there is nothing in it, as I kept that cow for years afterwards, and I am certain it would have been hard to have found a more healthy cow.

"I advised a well-known Sandgate milkman, who had the pear growing up against his fence, to try my method of using the pear, and he told me afterwards that he found it good. I may say that this man thought he would improve on my way, and also save water, by putting it through the chaffcutter, but he found his idea not feasible, as the pear, being greasy, clogged his machine. It often occurred to me, when I noticed the excessive, in fact, almost prohibitive, price of lucerne chaff, to publish in the Press my experience, but I refrained from doing so, as I dislike publicity; however, at a time like the present, I consider it is the duty of everyone to publish any information which may be useful."

General Notes.

SHOW DATES, 1918.

Gayndah.—Pastoral, Industrial, Agricultural, and Horticultural Association. Show dates: 2nd, 3rd, and 4th July, 1918.

Philpot Creek.—Philpot Farmers' Society. H. J. Brown, Secretary.

Rockhampton.—Rockhampton Agricultural Society. Show dates: 20th, 21st, and 22nd June.

Kilkivan.—Kilkivan Agricultural, Pastoral, and Industrial Association.

Kileoy.—Kileoy Pastoral, Agricultural, and Industrial Society. A. R. Hooper, Secretary.

Charleville.—Central Warrego Pastoral and Agricultural Association. Show dates: 7th and 8th May. L. O. Easton, Secretary.

Wallumbilla.—Wallumbilla Agricultural and Pastoral Association. James H. Fitzpatrick, Secretary.

Herberton.—Herberton Mining, Pastoral, and Agricultural Association. — Brownlee, Secretary. Show dates: 1st and 2nd April.

Mount Gravatt.—Mount Gravatt and District Agricultural, Horticultural, and Industrial Society. Show date: 14th September.

Wellington Point.—Wellington Point Agricultural, Horticultural, and Industrial Association. E. Becklup, Secretary. Show date: 20th July.

Beerwah.—Beerwah and Coochin Creek District Fruitgrowers and Farmers' Progress Association. E. F. Jones, Secretary.

Charters Towers.—The Towers Horticultural Society. Show dates: 21st and 22nd

Ipswich.—The Queensland Pastoral and Agricultural Society. Show dates: 22nd and 23rd May, 1918.

The Secretary of the Biggenden Agricultural and Pastoral Society of Southern Queensland notifies that the Annual Show fixed for the 27th and 28th of June, 1918, has been abandoned.



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The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR FEBRUARY, 1918.

Article.								FEBRUARY.	
								Prices.	
Bacon	...	...	...	...	...	...	lb.	9d. to 10d.	
Barley	...	...	...	...	...	...	bush.	2s. 6d. to 3s.	
Bran	...	...	...	...	...	...	ton	£5 10s.	
Broom Millet	...	...	...	...	...	...	"	£32 to £33	
Butter (First Grade)	...	...	...	...	...	...	cwt.	149s. 4d.	
Chaff, Mixed	...	...	...	...	...	...	ton	£4 10s.	
Chaff, Oaten	...	...	...	...	...	...	"	£6 to £6 5s.	
Chaff, Lucerne	...	...	...	...	...	...	"	£3 to £4 10s.	
Chaff, Wheaten	...	...	...	...	...	...	"	...	
Cheese	...	...	...	...	...	...	lb.	9½d. to 10d.	
Flour	...	...	...	...	...	...	ton	£12	
Hams	...	...	...	...	...	...	lb.	1s. 3d. to 1s. 10d.	
Hay, Oaten	...	...	...	...	...	...	ton	£6 10s. to £7.	
Hay, Lucerne	...	...	...	...	...	...	"	£2 10s.	
Hay, Wheaten	...	...	...	...	...	...	"	...	
Honey	...	...	...	...	...	...	lb.	2½d. to 3d.	
Maize	...	...	...	...	...	...	bush.	4s. to 4s. 11d.	
Oats	...	...	...	...	...	...	"	2s. 6d. to 2s. 10d.	
Onions	...	...	...	...	...	...	ton	£7 10s. to £8	
Peanuts	...	...	...	...	...	...	lb.	2d. to 5d.	
Pollard	...	...	...	...	...	...	ton	£7 5s.	
Potatoes	...	...	...	...	...	...	"	£2 10s. to £6.	
Potatoes (Sweet)	...	...	...	...	...	...	"	£2 5s. to £3.	
Pumpkins (Cattle)	...	...	...	...	...	...	ton	£3	
Eggs	...	...	...	...	...	...	doz.	1s. to 2s. 1d.	
Fowls	...	...	...	...	...	...	per pair	3s. to 7s. 5d.	
Ducks, English	...	...	...	...	...	...	"	2s. 9d. to 3s. 6d.	
Ducks, Muscovy	...	...	...	...	...	...	"	4s. to 7s. 3d.	
Geese	...	...	...	...	...	...	"	8s. 9d.	
Turkeys (Hens)	...	...	...	...	...	...	"	10s.	
Turkeys (Gobblers)	...	...	...	...	...	...	"	16s. to 21s.	
Wheat (Milling)	...	...	...	...	...	...	bush.	4s. 1½d.	

VEGETABLES—TURBOT STREET MARKETS.

Asparagus, per dozen bundles	...	...	...	...	...	...	1s. 6d. to 4s. 6d.
Cabbages, per dozen	...	...	...	...	...	...	...
Cauliflowers, per dozen	...	...	...	...	...	...	...
Celery, per bundle	...	...	...	...	...	...	...
Beans, per sugar bag	...	...	...	...	...	...	3s. 6d. to 7s.
Peas, per sugar bag	...	...	...	...	...	...	10s. to 11s.
Carrots, per dozen bunches	...	...	...	...	...	...	1s 3d. to 1s. 8d.
Beetroot, per dozen bunches	...	...	...	...	...	...	6d. to 9d.
Lettuce, per dozen	...	...	...	...	...	...	1s. to 1s. 6d.
Parsnips, per dozen bundles	...	...	...	...	...	...	6d. to 1s.
Sweet Potatoes, per sugar bag	...	...	...	...	...	...	2s. to 2s. 6d.
Table Pumpkins, per dozen	...	...	...	...	...	...	1s. 6d. to 2s. 6d.
Marrows, per dozen	...	...	...	...	...	...	1s. 6d. to 1s. 10d.
Tomatoes, per ¼-case	...	...	...	...	...	...	2s. to 7s. 5d.
Cucumbers, per dozen	...	...	...	...	...	...	...

SOUTHERN FRUIT MARKETS.

Article.						FEBRUARY.
						Prices.
Bananas (Queensland), per crate ...	...	...	...	...	...	9s. to 12s.
Bananas (Tweed River), per crate ...	...	...	...	...	...	14s.
Bananas (Fiji), per bunch ...	...	...	...	...	...	5s. to 6s.
Bananas (G.M.), per bunch ...	...	...	...	...	...	5s. to 7s.
Lemons (local), per bushel case ...	...	...	...	...	...	...
Mangoes, per case ...	...	...	...	...	...	4s. to 5s.
Mandarins, per case ...	...	...	...	...	...	...
Oranges (Navel), per case ...	...	...	...	...	...	10s. to 14s.
Oranges (Queensland), per case ..	...	...	...	...	...	6s. to 7s.
Papaw Apples, per half-bushel case ...	...	...	...	...	...	6s. to 7s.
Passion Fruit, per half case ...	...	...	...	...	...	4s. to 8s.
Pineapples (Queens), per double case ...	...	...	...	...	...	10s. to 14s.
Pineapples (Common), per double case ...	...	...	...	...	...	7s. to 9s.
Tomatoes (Queensland), per half-bushel case ...	...	...	...	...	...	1s. 6d. to 3s.
Cucumbers, per bushel case ...	...	...	...	...	...	...
Strawberries, per lb. ...	...	...	...	...	...	...

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.						FEBRUARY.
						Prices.
Apples, Eating, per case ...	...	...	...	...	...	2s. 3d. to 4s. 6d.
Apples, Cooking, per case ...	...	...	...	...	...	2s. 6d. to 5s.
Apricots, per case ...	...	...	...	...	...	...
Bananas (Cavendish), per dozen ...	...	...	...	...	...	3d. to 5d.
Bananas (Sugar), per dozen ...	...	...	...	...	...	3½d. to 4d.
Cape Gooseberries, per quarter-case ...	...	...	...	...	...	...
Cherries, per box ...	...	...	...	...	...	...
Citrons, per hundredweight ...	...	...	...	...	...	10s.
Cocanuts, per sack ...	...	...	...	...	...	15s. to 25s.
Cumquats, per quarter-case ...	...	...	...	...	...	...
Grapes, per lb. ...	...	...	...	...	...	...
Lemons (Lisbon), per quarter-case ...	...	...	...	...	...	8s. to 12s. 6d.
Mandarins, per quarter-case ...	...	...	...	...	...	...
Mangoes, per quarter-case ...	...	...	...	...	...	2s. to 7s. 5d.
Oranges (Navel), per quarter-case ...	...	...	...	...	...	...
Oranges (Seville), per hundredweight ...	...	...	...	...	...	...
Oranges (other), per case ...	...	...	...	...	...	...
Papaw Apples, per quarter-case ...	...	...	...	...	...	1s. 9d. to 2s. 3d.
Passion Fruit, per half-bushel case ...	...	...	...	...	...	2s. to 5s.
Peaches, per half-bushel case ...	...	...	...	...	...	2s. to 3s. 6d.
Pears, per half-bushel case ...	...	...	...	...	...	...
Peanuts, per lb. ...	...	...	...	...	...	3d. to 5d.
Persimmons, per half-case ...	...	...	...	...	...	1s. 6d. to 3s.
Pineapples (Ripleys), per dozen ...	...	...	...	...	...	9d. to 2s. 3d.
Pineapples (Rough), per dozen ...	...	...	...	...	...	6d. to 1s. 6d.
Pineapples (Smooth), per dozen ...	...	...	...	...	...	...
Plums, per quarter case ...	...	...	...	...	...	4s. to 8s. 6d.
Rockmelons, per dozen ...	...	...	...	...	...	...
Strawberries, per dozen boxes ...	...	...	...	...	...	...
Tomatoes, per quarter-case ...	...	...	...	...	...	2s. to 7s. 6d.
Watermelons, per dozen ...	...	...	...	...	...	...

TOP PRICES, ENOGGERA YARDS, JANUARY, 1918.

Animal.	JANUARY.	
	Prices.	
Bullocks	£21 15s. to £27 2s. 6d.	
Cows	£16 10s. to £18 5s.	
Cows (Single)	...	
Merino Wethers	49s.	
Crossbred Wethers	48s.	
Merino Ewes	41s.	
Crossbred Ewes	44s.	
Lambs	37s.	
Pigs (Backfatters)	...	
Pigs (Baconers)	74s.	
Pigs (Porkers)	50s.	
Pigs (Slips)	19s. 6d.	

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JANUARY, 1918, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JANUARY, 1918 AND 1917, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Jan.	No. of Years' Records.	Jan., 1918.	Jan., 1917.		Jan.	No. of Years' Records.	Jan., 1918.	Jan., 1917.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Atherton	13·63	15	15·94	3·75	Nambour	9·44	20	15·14	5·43
Cairns	17·17	34	13·73	5·57	Nanango	4·52	34	7·69	7·98
Cardwell	17·24	44	25·07	10·01	Rockhampton	9·05	29	34·36	5·27
Cooktown	15·32	40	8·53	7·23	Woodford	7·13	29	15·79	9·90
Herberton	10·02	29	14·81	6·78	<i>Darling Downs.</i>				
Ingham	16·84	24	27·25	11·02	Dalby	3·28	46	5·13	3·64
Innisfail	21·83	35	16·48	10·31	Emu Vale	3·25	20	4·17	5·09
Mossman	16·75	5	17·08	6·21	Jimbour	3·88	28	5·09	4·01
Townsville	11·52	45	27·75	20·97	Miles	3·99	31	4·74	3·72
<i>Central Coast.</i>					Stanthorpe	3·70	43	3·72	3·20
Ayr	11·70	29	31·13	21·80	Toowoomba	5·12	44	6·15	4·76
Bowen	9·59	45	46·57	12·76	Warwick	3·73	29	3·17	3·90
Charters Towers	5·53	34	12·07	14·72	<i>Maranoa.</i>				
Mackay	14·02	45	85·09	10·26	Roma	3·44	42	8·93	3·01
Proserpine	16·37	13	58·90	19·95	<i>State Farms, &c.</i>				
St. Lawrence	9·38	45	49·44	4·28	Bungeworgorai	2·62	5	8·76	2·58
<i>South Coast.</i>					Gatton College	4·43	17	7·36	4·81
Biggenden	5·51	17	9·32	...	Gindie	3·28	17	21·59	4·50
Bundaberg	9·45	33	17·90	9·05	Hermitage	2·76	10	3·79	4·50
Brisbane	6·51	67	7·70	9·07	Kairi	9·49	5	18·30	4·06
Childers	8·37	21	13·89	5·28	Kamerunga	18·41	26	9·08	3·60
Crohamhurst	13·02	25	20·20	10·32	Sugar Experiment Station, Mackay	14·82	19	78·17	11·80
Esk	5·60	29	7·54	7·01	Warren	8·53	5	34·31	5·33
Gayndah	4·84	45	9·83	6·77					
Gympie	6·75	46	11·17	4·48					
Glasshouse M'tains	9·43	8	...	7·56					
Kilkivan	5·76	37	13·06	4·27					
Maryborough	7·46	45	14·07	5·90					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for January this year, and for the same period of 1917, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Officer.

Orchard Notes for April.

THE SOUTHERN COAST DISTRICTS.

The gathering and marketing of citrus fruit, as well as of pines, bananas, custard apples, persimmons, &c., is the principal work of the month. In the Notes for March attention was drawn to the necessity for keeping all pests in check, particularly those attacking the ripening fruit. As it is the height of folly to look after the orchard thoroughly during the growing period of the crop and then to neglect the crop when grown, every possible care must be taken to keep fruit fly, peach moth, black brand, or other pests that destroy or disfigure the fruit in check, and this can only be accomplished by combined and systematic action. Citrus fruit at this time of the year often carries badly, as the stem is tender, easily bruised, full of moisture, and, consequently, very liable to the attacks of the blue mould fungus, which causes specking. The loss from this cause can be lessened to a considerable extent by carefully attending to the following particulars:—

- 1st. Never allow mouldy fruit to hang on the trees or to lie about on the ground. It should be gathered and destroyed, so that the countless spores which are produced by the fungus shall not be distributed broadcast throughout the orchard, infesting many fruit, and only waiting for a favourable opportunity, such as an injury to the skin by an insect or otherwise, combined with favourable weather conditions (heat and moisture), to start into growth.
- 2nd. Handle the fruit carefully to prevent bruising. Cut the fruit, don't pull it, as pulling is apt to plug the fruit—that is to say, to either pull the stem out or injure the skin round the stem—and a fruit so injured will go mouldy.
- 3rd. Sweat or dry the fruit thoroughly; if the weather is humid, laying the fruit out in the sun on boards or slabs is a very good plan.
- 4th. After sweating, examine the fruit carefully, and cull out all bruised or punctured fruit, and only pack perfectly sound dry fruit. It is better for the loss to take place in the orchard than for the loss to take place in the case in transit.
- 5th. If the mould is very bad, try dipping the fruit for a few seconds in a 2 per cent. solution of formalin. This will kill the spores, and if the fruit is placed in the sun and dried quickly before packing there will not be much chance of its becoming reinfested.

Don't gather the fruit too green, especially such varieties as the Beauty of Glen Retreat Mandarins, as immature fruit spoils the sale of the good article.

If the orchard has not been cleaned up after the summer rains, do so now; and do any other odd jobs that may be required, such as mending fences, grubbing out dead or worthless trees, cleaning out drains, &c.

Strawberry planting may be continued, and where new orchards are to be planted continue to work the soil so as to get it into the best possible tilth.

THE TROPICAL COAST DISTRICTS.

Clean up the orchards after the rainy season. Look out for scale insects, and cyanide or spray for same when necessary.

Go over the trees carefully, and when there is dead wood or water sprouts remove them. If bark fungus is showing, paint the affected branches with sulphur and lime wash. Clean up bananas, pineapples, and other fruits, as after the end of the month it is probable that there will not be any great rainfall, so that it is advisable to keep the ground well cultivated and free from weeds, so as to retain in the soil the moisture required for the trees' use during the winter months. Keep bananas netted; destroy guavas wherever found.

THE SOUTHERN AND CENTRAL TABLELANDS.

If the orchards and vineyards have not already been cleaned up, do so. Cultivate or plough the orchard, so as to get the surface soil into good tilth, so that it can absorb and retain any rain that falls, as even though the trees will simply be hardening off their summer's growth of wood, it is not advisable to let the ground dry out. When citrus fruits are grown, attend to them in the manner recommended for the Southern Coast Districts; and when grown in the dry parts, keep the land in a state of good cultivation. Should the trees require it, a light watering may be given. Do not irrigate vines; let them ripen off their wood.

Farm and Garden Notes for April.

FIELD.—The wheat land should now be ready for sowing the early wheats, and that which has not been prepared should be ploughed without delay, April, May, and June at latest being the months for sowing. The main potato crop, planted in February and March, will now be ready for a first or second hilling up. The last of the maize crop will now have been got in. Where cotton is grown, the pods will now be opening, and advantage should be taken of dry weather to get on with the picking as quickly as possible. Picking should not be begun until the night dew has evaporated nor during rain. Sorghum seed will be ripe. Tobacco also will be ripening, and either the leaves or the whole plant harvested. Lucerne may be sown, as the growth of weeds has now slackened off, but the ground must be thoroughly prepared and cleaned. Sow oats, barley, rye, wheat, mangolds, and Swede turnips. Plant out paspalum roots. Seed wheat of whatever variety soever should be dipped in a solution of sulphate of copper (bluestone) in the proportion of 1 lb. of sulphate to 24 gallons of water. The seed may also be treated with hot water by plunging it in a bag into hot water at 120 degrees Fahr. for a minute or two, and then into water heated to 135 degrees Fahr. Allow it to remain in this for ten minutes, moving it about all the time. Then plunge the seed into cold water and spread out to dry. This plan is useful in districts where bluestone may not be obtainable. Another safeguard against bunt, smut, black and red rust is to treat the seed with formalin at the rate of 1 lb. of formalin to 40 gallons of water. It is colourless and poisonous, and should be kept where no children or persons ignorant of its nature can have a chance of obtaining it. To treat the seed, spread it on a wooden floor and sprinkle the solution over it, turning the grain over and over until the whole is thoroughly wetted. Then spread it out to dry, when it will be ready for sowing. Instead of sprinkling, dipping may be resorted to. A bushel or so of seed is placed in a bag and dipped in the solution. During five minutes the bag is plunged in and out, and then the seed is turned out to dry. Formalin is less injurious to the grain than bluestone, but, while the latter can be used over and over again, formalin becomes exhausted. It therefore follows that only the amount required for immediate use for sprinkling should be prepared. Do not sow wheat too thickly. Half a bushel to the acre is sufficient—more on poor land and less on rich soils. On light sandy soil the wheat should be rolled. On sticky land it should only be rolled when the land is dry, otherwise it will cake, and must be harrowed again after rolling. When the wheat is 6 in. high go over it with light harrows. If the autumn and winter should prove mild and the wheat should lodge, it should be kept in check by feeding it off with sheep.

KITCHEN GARDEN.—Hoe continually among the crops to keep them clean, and have beds well dug and manured, as recommended last month, for transplanting the various vegetables now coming on. Thin out all crops which are overcrowded. Divide and plant out pot-herbs, giving a little water if required till established. Sow broad beans, peas, onions, radish, mustard and cress, and all vegetable seeds generally except cucumbers, marrows, and pumpkins. Early celery should be earthed up in dry weather, taking care that no soil gets between the leaves. Transplant cauliflowers and cabbages, and keep on hand a supply of tobacco waste, preferably in the form of powder. A ring of this round the plants will effectually keep off slugs.

FLOWER GARDEN.—The operations this month will depend greatly on the weather. If wet, both planting and transplanting may be done at the same time. Camellias, gardenias, &c., may be removed with safety. Plant out all soft-wooded plants such as verbenas, petunias, penstemons, &c. Sow annuals, as carnations, pansy, mignonette, daisy, snapdragon, dianthus, stocks, candytuft, phlox, sweet peas, &c. Those already up must be pricked out into other beds or into their permanent positions. Growth just now will not be too luxuriant, and shrubs and creepers may be shortened back. Always dig the flower beds rough at first, then apply manure, dig it in, and after this get the soil into fine tilth. Land on which you wish to raise really fine flowers should have a dressing of bonedust lightly turned in. Wood ashes also form an excellent dressing for the garden soil. Prune out roses. These may be planted out now with perfect success. Take up dahlia roots, and plant bulbs as recommended for March. Layers that have made sufficient roots should now be gradually severed from the plant, and left for a fortnight before potting, to ripen the young roots.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE.

1918.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		PHASES OF THE MOON.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	4.57	6.46	5.21	6.41	5.41	6.19	5.58	5.46	The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania.
2	4.58	6.46	5.22	6.41	5.41	6.18	5.59	5.45	
3	4.59	6.46	5.23	6.40	5.42	6.17	5.59	5.44	H. M.
4	4.59	6.46	5.24	6.40	5.43	6.16	6.0	5.43	
5	5.0	6.46	5.25	6.39	5.44	6.15	6.0	5.42	5 Jan. ☾ Last Quarter 9 49 p.m.
6	5.1	6.47	5.25	6.39	5.45	6.14	6.1	5.41	13 „ ● New Moon 8 36 a.m.
7	5.2	6.47	5.26	6.38	5.45	6.13	6.1	5.39	20 „ ☾ First Quarter 12 38 „
8	5.3	6.47	5.27	6.37	5.46	6.12	6.2	5.38	27 „ ○ Full Moon 1 14 p.m.
9	5.3	6.47	5.28	6.36	5.46	6.11	6.2	5.37	The Moon will be at Perigee on 15th, Apogee on 3rd and 31st.
10	5.4	6.48	5.29	6.35	5.47	6.10	6.3	5.36	
11	5.5	6.48	5.29	6.35	5.47	6.9	6.3	5.35	4 Feb. ☾ Last Quarter 5 52 p.m.
12	5.6	6.47	5.30	6.34	5.48	6.8	6.4	5.34	11 „ ● New Moon 8 5 „
13	5.6	6.47	5.31	6.33	5.48	6.7	6.4	5.33	18 „ ☾ First Quarter 10 57 a.m.
14	5.7	6.47	5.32	6.32	5.49	6.6	6.5	5.32	26 „ ○ Full Moon 7 35 p.m.
15	5.8	6.47	5.32	6.32	5.49	6.5	6.5	5.31	The Moon will be at Perigee on 12th, Apogee on 28th.
16	5.9	6.47	5.33	6.31	5.50	6.3	6.6	5.30	
17	5.9	6.47	5.34	6.30	5.50	6.2	6.6	5.29	6 Mar. ☾ Last Quarter 10 44 a.m.
18	5.10	6.47	5.35	6.29	5.51	6.1	6.7	5.28	
19	5.11	6.47	5.35	6.28	5.51	6.0	6.7	5.27	13 „ ● New Moon 5 52 p.m.
20	5.12	6.46	5.36	6.28	5.52	5.59	6.8	5.26	19 „ ☾ First Quarter 11 30 „
21	5.13	6.46	5.37	6.27	5.52	5.58	6.8	5.25	28 „ ○ Full Moon 1 33 „
22	5.13	6.46	5.37	6.26	5.53	5.57	6.8	5.24	The Moon will be at Perigee on 13th, Apogee on 27th.
23	5.14	6.45	5.38	6.25	5.53	5.56	6.9	5.23	
24	5.15	6.45	5.38	6.24	5.54	5.55	6.9	5.23	4 April ☾ Last Quarter 11 33 p.m.
25	5.16	6.45	5.39	6.23	5.54	5.54	6.10	5.22	
26	5.16	6.44	5.39	6.22	5.55	5.52	6.10	5.21	11 „ ● New Moon 2 34 „
27	5.17	6.44	5.40	6.21	5.55	5.51	6.11	5.20	18 „ ☾ First Quarter 2 8 „
28	5.18	6.43	5.40	6.20	5.56	5.50	6.11	5.19	26 „ ○ Full Moon 6 5 „
29	5.19	6.43	...	...	5.57	5.49	6.12	5.18	The Moon will be at Perigee on 10th, Apogee on 23rd.
30	5.19	6.42	...	...	5.57	5.48	6.12	5.18	
31	5.20	6.42	...	...	5.58	5.47	...	...	

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane.

At Roma the times of sunrise and sunset may be roughly arrived at by adding 17 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

For the sunrise and sunset at Rockhampton, Townsville, Cairns, and other places in Queensland, readers may be referred to the "Queenslander" to which newspaper monthly astronomical notes will be supplied.—D.E.

QUEENSLAND AGRICULTURAL JOURNAL

VOL IX.

APRIL, 1918.

PART 4.

Agriculture.

SEED WHEAT FOR DISPOSAL.

For a number of years wheat-breeding and the evolution and testing of new varieties of wheat have been carried out by the Department of Agriculture and principally at the Roma State Farm.

Comparative tests of standard varieties approved in other States have also been made. A selection from the two groups herein mentioned was made last season; the wheats being tested under field conditions in several districts of the State. Results indicate that these particular varieties deserve attention on the part of wheatgrowers. For this reason it has been decided to offer limited quantities for sale to *bona-fide* growers at 5s. 6d. per bushel (after cleaning and grading), f.o.r., Hermitage.

Orders for the undermentioned varieties (illustrated and described elsewhere in the Journal) should be sent on to the Under Secretary for Agriculture and Stock, Brisbane, accompanied by the necessary remittance. Applications will be treated according to priority, but it has been decided (in order to make the distribution as widespread as possible) to limit the quantity for any one applicant to 9 bushels in all. The grain is to some extent "weathered" through continuous rains interfering with harvesting operations, but official germination tests made show that the quality of the grain in this respect is quite satisfactory.

Crossbred Wheats.—Soutter's Early, BXF 37, BXF 86A, X 343-13, BXD-66, BX1P-12.

Approved Varieties from Other States.—Lotto, Warren.

Of Queensland Origin.—Amby, Piastre, Coronation, Bunge.

Soutter's Early.—A very early though sparse stooling wheat suitable for medium-late and late sowing on rich soils; short strawed and carries very little flag; straw slender but tough; heads medium length, not bearded; compact; glumes very slightly coloured, smooth; grain small, plump, and bright. This variety originated at Roma State Farm, where it has given good results, yielding up to 37½ bushels per acre. Owing to its early maturing habit and freedom from flag it escapes rust to a remarkable degree.

Warren.—A late mid-season variety suitable for early and main sowings, particularly on light soils; carrying a somewhat heavy flag and of fair stooling qualities; straw stout. Chaff smooth, white, and set firmly on the grain. Heads long and compact, slightly tapering, not bearded. Grain white, somewhat soft and starchy, long and rather over medium size when grown under good conditions. Is fairly rust-resistant, but is bunt-liable. An excellent hay wheat, and also of fair milling quality. An average of three years at Roma State Farm gave 22.9 bushels per acre.

BXF 86A.—A selection obtained from crossing Bunge and Federation. A free-stooling variety of medium height, suited for early sowing. Flag somewhat light, straw white, fine, but inclined to toughness. Heads long, closely set, not bearded, chaff smooth and of a delicate brown colour. Grain medium sized, smooth skin, and slightly yellow in colour.

Crossbred 343-13.—A selection made at Roma State Farm from this crossbred. Is a mid-season variety of medium-stooling habits, carrying a moderate amount of flag, suitable for main and medium late sowing. Straw fine, but fairly tough. Heads of medium length, slightly open, non-bearded. Chaff smooth and white in colour. Grain small, bright, and smooth-skinned, shallow crease. This variety gave universally satisfactory results in all test plots throughout the South-Western District. Yielded up to 33.7 bushels at Roma State Farm.

BXD 66.—A selection from a cross between Bunge and Durum which appears to be suited to the conditions of the South-Western District. A mid-season wheat of moderate stooling habits carrying little flag, suitable for main and medium late sowings. Straw fine and of medium toughness. Head compact, of medium length, non-bearded; chaff white. Grain medium length, plump, light brown in colour, and fairly hard.

BXF 37.—A selection from a Bunge-Federation cross. A mid-season variety suitable for early sowing, of moderate stooling habits, carries a medium quality of flag. Straw moderately stout. Head long and compact. Chaff smooth, light brown in colour. Grain medium sized, somewhat rough skinned, white in colour. This variety has given a yield of 37.2 bushels at Roma State Farm.



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PLATE 10.—1. SOUTTER'S EARLY.

2. WARREN.

3. BXF 86A.

4. CROSSBRED 343-13.

BX1P 12.—A selection obtained from crossing Bunyip and Indian Pearl. A free stooling variety suitable for early sowing, vigorous in growth and carrying a moderate amount of flag, straw tough, but

inclined to fineness. Heads short, compact, and carrying club tips which are semi-bearded. Chaff white, grain small but plump, having the characteristic hardness of the Indian Pearl variety.

Piastre.—An early maturing variety suitable for medium and late sowing which has done well in the Downs and Maranoa districts. Is a



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PLATE 11.—5. BxD 66.

6. BxF 37.

7. Bx1P 12.

8. PIASTRE.

9. LOTTO.

fairly free-stooling variety having a fine, moderately tough straw. Carrying a small amount of flag. Heads medium length, fairly compact, non-bearded, chaff white. Grain small, plump, and smooth-skinned with shallow crease. Semi-translucent.

Lotto.—A variety which has been introduced from Western Australia. A heavy stooling wheat suitable for medium early and main crop sowings, of average height, carrying a moderate amount of flag. Heads long and compact, non-bearded; chaff smooth and of a pale golden colour. Grain medium sized, plump, and semi-translucent.



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PLATE 12.—10. BUNGE.

11. FLORENCE.

12. AMBY.

13. CORONATION.

Bunge 1.—A variety suitable for main and medium late sowings that is well and favourably known throughout the wheatgrowing areas of Queensland. An excellent hay and grain wheat, rather a sparse stooler, carries little flag. Straw white and of medium fineness. Highly rust resistant. Heads of medium length, compact, and non-bearded and

inclined to set closely at tip; chaff smooth and white. Grain somewhat long, hard, and translucent. One of the most consistent yielders at

Amby.—A variety suitable for main crop sowing which originated in the Maranoa district. This selected wheat proved to be the best of a number of crossbred wheats tested several years ago at Amby on heavy black soil. It is a hardy mid-season variety and a good stooler, carrying a moderate amount of flag. Ears compact, non-bearded, chaff white and smooth. Grain plump and rather shotty in appearance, semi-translucent. Is an excellent milling wheat and has given good result in the Maranoa district.

Coronation.—A mid-season variety suitable for main or medium-late sowing on light country. Grown on heavy soils, it is somewhat inclined to produce flag, and the straw consequently becomes weaker. Is fairly rust resistant and withstands dry weather very well. Is suited to the South-Western District and drier portions of the Darling Downs. Heads of medium length, compact, and tip bearded, chaff smooth and white. Grain small, hard, plump and semi-translucent.

FARMERS AND TAXATION.

Amongst the earliest needs of farmers in any country of the world may be reckoned roads. Roads and bridges and culverts are essentials which cost money, and the money, whether found by the Government or by shire councils, must be raised by some form of taxation, such as rates, for instance. But as it has been the time-honoured privilege of farmers to grumble at the weather, so is it also their privilege to travel on well-made roads, cut them up with narrow-tired wheels, excavate huge ruts with timber wagons, and then to exclaim against the rates by means of which such damages are repaired and the roads kept in good order for their use and benefit. Taxation certainly sits not too lightly on the Queensland farmers since the war began. How would they feel if subjected to the heavy drains to which farmers in Europe are subjected, as described in the following from the "*Oklahoma Farmer*"?:—

"When the American farmer is inclined to feel 'gravely' over the conditions of his life, he will find some consolation in the thought that farmers in other countries are worse off than he is. In England, for instance, farmers are compelled to take out more licenses to conduct their business than any other class of business men. Some idea of the enormous tax on English farming can be had from the following letter written by an English farmer to his brother in Michigan. He says:— 'First of all, in January, I had to write to the Excise Officer for a form of exemption to keep my old sheep dog. The form came back in about a fortnight. Then I had to fill it up and return it before I got the license to keep it free of duty. Then I had to visit the post office to get another license, which cost me 7s. 6d.; it is to keep a spaniel, so that I could hunt the rabbits from the hedgerows. Then I had to pay 10s. for a gun license in order to shoot the rabbits, and I had to go to another magistrate's clerk to have another license approved. This was for an assistant to keep the rabbits down on my farm, which adjoins woodlands. As occasionally I drive the missus to market and sometimes ask a friend to ride, I have again to go to the post office to get a 15s. trap license. A couple of months ago I injured my leg and could not climb up into my trap, so I purchased a light-weight four-wheel. A letter from the local officer of Excise pointed out to me the fact that a license of a guinea had to be taken out. Cider running short, I had to provide something for my farm hands to drink, so I thought that I would

obtain a couple of sacks of barley malt—the barley being grown in England—and brew a few gallons of ale. To do this I had to take out another license. I have a traction engine, with which I do my farm work, such as threshing, &c., and between whiles a bit of hauling. This necessitates my taking out the most expensive license of all, a ten-pounder. On the farm there are usually a few partridges and a stray pheasant or two, reared and fed at my expense. To shoot these I have to obtain a game license, which costs me £3. Now, I sell a few gallons of milk, and to do this I have to get my premises registered by the local medical officer of health. This is practically another license. Flowing right through my farm is a splendid trout stream, yet before I can attempt to entice one of the spotted beauties from beneath its surface I have to take out another license. If I send my sow to a neighbour, I have to go to the policeman for a license for her, which he issues on condition that she does not remain away more than four days. You may smile, but it's an official fact. If I sell my neighbour a few pigs, I have to obtain a license to remove them. If I send a lot of fat baconers to town to be killed, another visit to the policeman is necessary. If I decide to have them killed at home, I must have my farm building licensed as a slaughter-house. If I have only to turn my pig across the road to clover, again I have to visit that policeman. As all these licenses have been necessary for my business, and not one of them is for luxury, such as male servants or armorial bearings, I really think that the farmer can justly claim that his business is the most licensed in the kingdom.'''

MARKET GARDENING.

A GOOD TOMATO FOR HOME GARDENS.

By W. S. CAMPBELL, Sydney.

Of the vast number of tomatoes I have tried from time to time, I find the variety "Carter's Sunrise" to be the best of all. It is extremely prolific, free from "black spot," of a fair size, excellent flavour, smooth, of bright, rich red colour, and is well worth the attention of all those who grow some, if not all, of their own vegetables. The fruit is somewhat small for market purposes, where large fruit, no matter of what quality, is in demand.

Some years ago I noticed in an English gardening periodical that the Royal Horticultural Society of England reported that in trials made with tomatoes at the Society's gardens, Carter's Sunrise was proved to be the best tomato raised for growing under glass or in the open garden. I obtained seeds from England, and found it to be so excellent that I have grown this variety only ever since, keeping it up to the mark by careful selection of seed.

Notwithstanding the present abnormal season, with a superabundance of rain, this tomato has not suffered in the least from "black spot" or other fungus diseases; and the fruit has been abundant and good. The number of fruit on a bunch generally ranges from seven to nine and more, all of a nice fair size for home use.

During the present season one plant produced a bunch of nineteen fruits, all of a good size, and this same plant has produced a further number of fruits during the past three months. It was planted late.

The best method of growing tomatoes is to train the plants to one stem, planting them 18 in. apart in rows about 3 ft. apart, or in a single row.

I find that rooted cuttings, kept through the winter, produce the earliest fruits. Last season I had a superabundance of excellent specimens of "Sunrise" for family use at a time when half-ripe specimens were sold in shops at 2d. each.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The following revised list of breeders of purebred cattle is published for the purpose of informing those who desire to improve their stock where the best cattle can be obtained in the State. The Department of Agriculture and Stock takes no responsibility in relation to the entries in the list; but, when inquiries were first made, the condition was imposed that the entries were to be only of stock that had been duly registered, or that were eligible for registration in the different herd books. The entries received were, in some cases, somewhat too confusing for proper discrimination, it has, therefore, now been decided that only such cattle as have been registered will be included. The lists previously published in the *Queensland Agricultural Journal* have now been withdrawn for revision.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
F. C. G. Gratton ..	"Towlestone," Kings-thorpe	2	14	Holstein Cattle Club Herd Book
T. Mullen	"Norwood," Chelmer	3	20	Queensland Jersey Herd Book
J. H. Paten	Yandina	6	21	Ayrshire Herd Book of Queensland
Queensland Agricultural College	Gatton	4	38	Ayrshire Herd Book of Queensland
		..	2	Ayrshire Herd Book of Scotland
		2	9	Holstein-Friesian Herd Book of Australia
		2	31	Jersey Herd Book of Queensland
J. W. Paten	Wanora, Ipswich ..	10	42	Ayrshire Herd Book of Queensland
M. W. Doyle	Moggill	4	12	Queensland Jersey Herd Book
G. A. Buss	Bundaberg	1	15	Herd Book of the Jersey Cattle Society of Queensland
W. Rudd	Christmas Creek, Beaudesert	2	10	Milking Shorthorn Herd Book of Queensland
M. F. and R. C. Ramsay	Talgai, Clifton ..	5	27	Herd Book of the Jersey Cattle Society of Queensland
George Newman ..	Wyreema	12	47	Holstein-Friesian Herd Book of Australia
R. Conochie	Brooklands, Tingoor	9	21	Queensland Jersey Herd Book

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
W. J. Barnes	Cedar Grove ..	10	37	Queensland Jersey Herd Book
T. B. Murray-Prior ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
W. J. Affleck	Grasmere, N. Pine ..	6	31	Queensland Jersey Herd Book
A. J. McConnel	Dugandan, Boonah	19	36	Australian Hereford Herd Book
A. Pickels	Blackland's Stud Farm, Wondai	4	62	Illawarra Dairy Cattle Herd Book of Queensland
G. C. Clark	East Talgai, Ellinthorp	3	7	New Zealand Herd Book
H. D. B. Cox	Sydney (entered brother's name)	3	16	Commonwealth Standard Jersey Herd Book
J. T. Perrett and Son	Coolabunia	2	36	Illawarra Herd Book of Queensland
State Farm	Kairi	4	8	Ayrshire Herd Book of Queensland
		1	2	Holstein-Friesian Herd Book of Australia
		45	127	Australian Hereford Herd Book
E. M. Lumley Hill ..	Bellevue House, Bellevue	2	22	Illawarra Herd Book of Queensland
W. T. Savage	Ramsay	50	400	Australian Hereford Herd Book
Tindal and Son	Gunyan, Inglewood	3	28	Queensland Jersey Herd Book
J. N. Waugh and Son	Prairie Lawn, Nobby	9	55	Ayrshire Herd Book of Queensland
J. H. Fairfax	Marinya, Cambooya (2)	25	100	Queensland Shorthorn Herd Book
C. E. McDougall	Lyndhurst Stud, Warwick (2)	6	20	Ayrshire Herd Book of Queensland
J. Holmes	"Longlands," Pittsworth	1	20	Illawarra Dairy Cattle Association
P. Biddles	Home Park, Netherby	1	9	Milking Shorthorn Herd Book
A. Rodgers	Torran's Vale, Lane-field	1	..	Holstein-Friesian Herd Book of Queensland
R. S. Alexander	Glenlomond Farm, Coolumboola	2	..	Holstein-Friesian Herd Book of Australia
		3	83	Ayrshire Herd Book of Queensland
State Farm	Warren	2	15	Holstein Cattle Club Herd Book
S. H. Hosking	Toogooloowah ..	2	11	Queensland Jersey Herd Book
W. J. H. Austin	Hadleigh Jersey Herd, Boonah	..	6	Commonwealth Standard Herd Book
Ditto	ditto	7	21	Ayrshire Herd Book of Queensland
H. M. Hart	Glen Heath Stud, Yalangur	3	9	Holstein-Friesian Herd Book of Queensland
C. Behrendorff	Inavale Stud Farm, Boonah	25	77	Ayrshire Herd Book of Queensland
F. A. Stimpson	Ayrshire Stud Farm, Fairfield, South Brisbane	5	21	Ayrshire Herd Book of Australia
M. L. Cochrane	Paringa Farm, near Cairns			

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
Albert Cook	"Greenmount," Mackay	1	8	A.-A. Stud Book, New Zealand
Thomas Brown ..	"Bellgrove," Kingaroy	1	14	Do.
Higgins Bros. ..	Sandy Creek, Leslie, Q.	6	2	Do.
Calcino Bros. ..	"Summariva," Charleville	3	4	Do.
W. M. McKelvie ..	"Undulla," Miles ..	5	4	Do.
James Connors ..	"Glen Erin," Nanango	1	2	Do.
J. A. Mackintosh ..	"Yundah," Warwick	2	8	Do.
M. J. Luff	Kaimkillenbun ..	1	1	Do.
A. Spencer	Brisbane	2	1	Do.
Beak Pastoral Co. ..	Rockhampton ..	2	10	Do.
W. Jackson	Central Farm, Savannah, Mackay	1	1	Do.
E. Swayne, M.L.A. ..	West Plane Creek ..	1	2	Holstein-Friesian Herd Book of Queensland
Godfrey Morgan ..	"Arubial," Condamine	3	6	Queensland Shorthorn Herd Book
John Anderson ..	"Fairview," Southbrook	7	34	Ayrshire Herd Book of Queensland

THE BLOW-FLY PEST.

ANOTHER FLY-TRAP.

Mr. H. A. Adams, Yalleroi, sends us the following suggestion for the construction of a fly trap:—

As the blowfly pest is one that many have to deal with, myself included, and many are the devices to cope with them that have been invented, and many are the claims of their respective merits (the "Destructo" fly-trap and many others which are costly), and I do not think they are worth the trouble, from the results obtained, I give you this, if you think it is worth the print. I have tried it, and I believe it outclasses all the other traps I have seen.

Get a kerosene tin, cut it on the two ends and one side, leaving the one side uncut; the cut must be made to allow the right-hand half to be as high as possible above the left-hand half. Having cut the two ends and one side, turn over to the right hand the higher half of the tin, and the uncut side will keep the two firmly together. Put a piece of fine soft wire around the two to keep them from tipping; punch four holes in it, one in each corner, to hang with wire to trees or fence; in the lower half of the tin, put your bait—the best of all, the inside or entrails of a sheep, but they must be green or highly decomposed before using. In the higher half of the tin put your arsenical solution; add to that some sugar; paint the bait with this solution and allow some to remain in the bottom of the bent half, as the fly will go for the moisture in the bottom, it being sweetened. Fill the top half of the tin with arsenical solution, get two strips of flannel, about 2 in. wide and long enough to go to the bottom of the liquid and rest on the bait in the lower tray or half of the tin; the flannel will syphon the liquid from the higher tray to the lower on to the meat, until the whole of the liquid is exhausted, keeping the bait well poisoned. You will have every fly in the vicinity by this simple method.

But do not use any meat or bait unless it is first thoroughly decomposed, as the arsenical solution will to a great extent prevent it from decomposing.

SHEEP MAGGOT FLY PEST.

By L. G. JONES.

A CRITICAL ESTIMATE OF THE FLOCKMASTERS' PRACTICE IN COMBATING THIS PEST.

After carefully reviewing this subject, I have come to the conclusion that pastoralists are not acting in a right manner when they continue the old-fashioned plan of dagging the sheep. But instead, the dags should be left on the sheep and poisoned by submerging in a very strong arsenical solution.

FORMULAE.

Arsenic, 1 lb.; washing soda, $\frac{1}{2}$ lb. To be prepared in the following manner:—Take rain water 4 gallons, and add to it $\frac{1}{2}$ lb. washing soda. Heat to near the boil (205-206 Fah.). At this point add 1 lb. of arsenic (commercial) and bring as quickly as possible to the boil, and continue to boil for about fifteen minutes (after putting in the arsenic do not stir longer than is necessary to distribute the arsenic). Now, N.B., just as you lift from or draw the fire, have ready 4 pints of *cold water* and drop it into the mixture and stir well for about five minutes. Experience has shown me that after arsenic has been boiled in water it goes more completely into solution when suddenly put off the boil; hence the reason for stressing these directions. If "hard" or creek water is used, proceed as directed for rain water, except use 4 oz. of washing soda instead of 8 oz. If water is "hard," too much washing soda will further harden it.

Then when the fly strikes or lays her eggs in the dags, the dags will be in such a condition as to prevent the maggots coming to maturity. *Don't lay poison baits or poison any carcasses*, because the laying of these baits and poisoning of these carcasses are the cause of your troubles, in this direction, being intensified to-day. You have driven the fly from her natural medium, and caused her to go further a-field—to wit, the sheep. A non-poisonous offal fly-trap would be better to use than the poisonous offal trap, and so entice her away from the sheep. This would at least have the advantage of enabling you to burn any carcasses of dead stock that are lying about the paddocks instead of leaving them as an attraction for the fly, and if the offal only of healthy sheep were hung up, no harm could come of it. If this is done, hang your trap low, about 3 ft. from the ground. Blowflies always fly low to the ground. The offal fly-trap is very ingenious and clever, but it is not calculated to work for any length of time, for the reason that the maggot fly has the power of selection very strongly developed, and when she finds that she is getting no results from her industry, she will soon become "fly-trap shy." So, likewise, will she treat the poisoned dags, and so transfer her energies elsewhere, to the relief of the sheep and appreciation of the owner. To follow this article to a proper conclusion, it is necessary that the sheep should have an arsenical salt lick, for which I cannot do better than refer the reader to my article that appeared in the February issue of the *Queensland Agricultural Journal*, which, in my opinion, would lend itself well to this treatment of the fly pest. The doses for a sheep given there would not, in my opinion, be all absorbed into the system of the animal partaking of it. Nor is it necessary that it should be; therefore, they would pass out with the droppings, and the droppings would be in such a condition as to greatly retard the development of the maggots. The maggots thrive or mature only in a suitable medium, otherwise they cease to become active, and the possibilities of the pest would be greatly paralysed. And thus we bring about the altered condition of the medium that brings about the activity of the blowfly.

In further dealing with this pest, an excellent plan is to keep a watchful eye on the sheep's bedding hills, and examine the dung (early morning is the most appropriate time), when the experienced eye will quickly notice if there is anything abnormal about it. If you find liquid manure, immediately muster or gather your sheep and treat them accordingly. When approaching the sheep's camping ground, always remember to do so from a westerly direction, because the sheep invariably move off towards the morning sun, and by so advancing you will not disturb your sheep. Practice these suggestions, and you will not regret it.

If the fly strikes a sheep on any part of the body other than the tail, it is because of the yelk being diseased, that sticky kind that appears in the wool fibre, and has a tendency to stunt the growth, discolour the wool, and always has a damp and sticky feel, and often a bad smell. When this is present the sheep are not in good health; they require medicine. Iron is a very appropriate medicine for sheep, and for its proper form and vehicle, I refer you again to the February issue of the *Queensland Agricultural Journal*, and under the heading of "A Natural Remedy for Worms and Blood Diseases in Sheep," it will be found.

Summed up, it all means: Poison dags *only*, and so make the pest sheep-shy.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RETURNS OF COWS FROM 27TH JANUARY TO 26TH FEBRUARY, 1918.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Belinda ...	Ayrshire ...	14 Jan., 1918	988	4.3	49.15	
Mistress Bee ...	Jersey ...	23 Jan. „	844	4.8	47.42	
Lady Margaret ...	Ayrshire ...	27 Dec., 1917	903	3.9	41.13	
Violette's Peer's Girl	Jersey ...	26 Oct. „	540	6.3	39.90	
Auntie's Lass ...	Ayrshire ...	5 July „	656	4.8	37.90	
Leading Lady ...	Jersey ...	26 Dec. „	722	4.4	37.10	
Lady Loch II. ...	Ayrshire ...	3 June „	493	6.3	35.92	
Jeannie ...	„ ...	13 Dec. „	785	3.9	35.82	
Iron Plate ...	Jersey ...	14 Oct. „	731	4.2	35.52	
Burlesque ...	„ ...	6 Oct. „	481	6.0	33.67	
Leonie ...	Ayrshire ...	4 Sept. „	510	5.7	33.67	
Miss Edition ...	Jersey ...	12 Nov. „	715	3.6	33.45	
Comedienne ...	„ ...	13 Dec. „	505	5.7	33.33	
Skylark ...	Ayrshire ...	24 May „	488	5.9	33.05	
Thornton Fairetta	Jersey ...	30 June „	427	6.6	33.04	
Songstress ...	Ayrshire ...	1 Oct. „	529	5.2	32.15	
Lilia ...	„ ...	11 July „	554	5.0	32.13	
Miss Bell ...	Jersey ...	27 June „	528	5.1	31.68	
Lady Dorset ...	Ayrshire ...	14 Aug. „	629	4.3	31.45	
Glow VI. ...	Guernsey ...	9 Nov. „	791	3.4	30.53	
College Bluebell ...	Jersey ...	28 June „	581	4.3	30.10	
Miss Edith ...	„ ...	23 Dec. „	702	3.7	30.08	
College Cold Iron	„ ...	7 Dec. „	516	5.0	29.94	
College Ma Petite	„ ...	10 Nov. „	543	4.6	29.53	
Hedge's Nattie ...	Holstein ...	1 Feb., 1918	586	4.4	29.41	
College Damsel ...	„ ...	12 July, 1917	702	3.6	29.08	
Miss Security ...	Ayrshire ...	27 Mar. „	436	5.4	28.99	
Nina ...	Shorthorn ...	6 Sept. „	684	3.6	28.76	
Princess Kate ...	Ayrshire ...	28 June „	362	6.7	27.85	
La Hurette Hope	Jersey ...	22 Aug. „	482	5.0	27.81	
Hedge's Dutchmaid	Holstein ...	9 Sept. „	639	3.8	27.70	
Netherhall Queen Kate	Ayrshire ...	30 June „	551	4.3	27.55	
Sweet Meadows ...	Jersey ...	8 Aug. „	468	4.9	26.86	
College St. Margaret	„ ...	9 Nov. „	552	4.2	26.49	
College Mermaid ...	„ ...	21 Aug. „	459	5.0	26.43	
Lady Annette ...	Ayrshire ...	19 Oct. „	607	3.6	26.30	
Miss Betty ...	Jersey ...	27 Mar. „	439	5.0	25.23	
Buttercup ...	Shorthorn ...	2 June „	454	4.7	25.15	
Rosine ...	Ayrshire ...	21 June „	522	4.2	24.97	
Glade ...	Shorthorn ...	29 Mar. „	363	5.7	24.20	
Netherton Belle ...	Ayrshire ...	17 July „	627	3.4	23.98	
Lerida II. ...	„ ...	2 June „	389	5.3	23.56	
Snowflake ...	Shorthorn ...	17 May „	391	4.9	22.25	
Hedge's Madge ...	Holstein ...	22 Mar. „	415	3.7	21.51	
Confidence ...	Ayrshire ...	25 June „	427	4.4	21.36	
Prim ...	Holstein ...	23 Aug. „	605	3.1	21.18	
Lady Mitchell ...	„ ...	26 Sept. „	505	3.5	20.20	

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, FEBRUARY, 1918.

Much better weather has prevailed throughout the month, but it came rather late to cause any noticeable improvement in egg-production after the severe weather we had experienced during the preceding months. A large number of birds are in moult, but it is pleasing to note that many of them are laying and moulting at the same time. Stamina in the stock competing is very easily detected at the present time, and closely-bred birds are showing signs of their weakness. Messrs. C. C. Dennis and J. Zahl each lost a bird during the month. The following are the individual records:—

Competitors.	Breed.	Feb.	Total.
LIGHT BREEDS.			
E. Chester	White Leghorns ...	130	1,514
G. Chester	Do.	103	1,308
Oaklands Poultry Farm ...	Do.	94	1,270
*G. H. Turner	Do.	98	1,267
W. R. Crust	Do.	92	1,264
W. Becker... ..	Do.	102	1,259
*J. M. Manson	Do.	95	1,244
F. W. Leney	Do.	73	1,237
Kelvin Poultry Farm ...	Do.	89	1,217
T. Taylor	Do.	97	1,208
D. Fulton	Do.	107	1,198
*A. T. Coomber	Do.	89	1,179
*J. R. Wilson	Do.	76	1,165
T. A. Pettigrove, Victoria	Do.	75	1,164
Chris. Porter	Do.	73	1,149
*J. Zahl	Do.	80	1,143
Moritz Bros., S.A.	Do.	71	1,132
J. G. Richter	Do.	87	1,128
Quinn's Post Poultry Farm	Do.	69	1,111
T. B. Hawkins	Do.	90	1,103
*Mrs. J. R. D. Munro	Do.	76	1,001
Mrs. W. D. Bradburne, N.S.W.	Do.	112	1,088
J. L. Newton	Do.	83	1,088
C. Knoblauch	Do.	102	1,087
A. Shillig	Do.	72	1,076
*Dixie Egg Plant	Do.	66	1,071
A. H. Padman, S.A.	Do.	64	1,070
Mrs. S. J. Sear	Do.	101	1,068
J. Holmes	Do.	77	1,065
C. H. Singer	Do.	109	1,050
*A. W. Bailey	Do.	68	1,046
Mars Poultry Farm	Do.	65	1,044
L. G. Innes	Do.	81	1,043
G. J. White	Do.	79	1,037
E. Cross	Do.	64	1,030
F. Clayton, N.S.W.	Do.	53	1,022
S. C. Chapman	Brown Leghorns... ..	85	1,020
C. P. Buchanan	White Leghorns... ..	89	1,019
*T. Fanning	Do.	38	999
E. A. Smith	Do.	80	996
Miss Hinze	Do.	80	987
J. Ferguson	Do.	72	985

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	Jan.	Total.
LIGHT BREEDS— <i>continued.</i>			
Geo. Williams	White Leghorns ...	74	982
R. Holmes	Do.	65	977
G. Howard	Do.	65	968
*A. E. Walters	Do.	45	956
Mrs. J. Carruthers	Do.	70	955
*Dr. E. C. Jennings	Do.	76	935
*C. C. Dennis	Do.	0	822
HEAVY BREEDS.			
*R. Burns	Black Orpingtons ...	78	1,350
*Mars Poultry Farm	Do.	112	1,308
W. Smith	Do.	90	1,204
A. E. Walters	Do.	86	1,187
*E. F. Dennis	Do.	78	1,143
W. S. Hanson, N.S.W.	Do.	72	1,118
P. C. McDonnell, N.S.W.	Do.	81	1,115
F. A. Claussen	Rhode Island Reds ...	8	1,100
Mrs. J. H. Jobling, N.S.W.	Black Orpingtons ...	78	1,071
*E. A. Smith	Do.	92	1,071
D. Kenway, N.S.W.	Do.	89	1,040
H. Jobling, N.S.W.	Do.	68	1,034
Cowan Bros., N.S.W.	Do.	62	999
C. B. Bertelsmeier, S.A.	Do.	80	983
King and Watson, N.S.W.	Do.	71	982
*Oakland Poultry Farm	Do.	63	959
*Miss Hinze	Do.	50	957
R. Burns	S. L. Wyandottes ...	87	938
J. M. Manson	Black Orpingtons ...	69	931
E. Morris	Do.	39	890
C. C. Dennis	White Wyandottes ...	84	887
*Kelvin Poultry Farm	Plymouth Rocks ...	78	886
*F. W. Leney	Rhode Island Reds ...	45	748
F. F. Clayton	Do.	45	727
Totals	...	5,657	78,380

* Indicates that the pen is engaged in the single hen test.

RESULTS FROM SINGLE HEN PENS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
G. H. Turner	170	192	234	242	201	228	1,267
J. M. Manson	206	220	177	175	219	247	1,244
A. T. Coomber	188	140	232	217	205	197	1,179
J. R. Wilson	208	184	179	203	187	203	1,165
J. Zahl	223	110	234	127	233	216	1,143
Mrs. Munro	244	189	143	153	146	226	1,101
Dixie Egg Plant	175	194	178	219	105	200	1,071
A. W. Bailey	33	193	218	29	210	182	1,046
T. Fanning	137	192	181	146	146	197	999
A. E. Walters	120	130	181	201	170	174	956
Dr. Jennings	127	115	187	167	205	134	935
C. C. Dennis	176	89	77	164	162	14	853

EGG-LAYING COMPETITION—continued.
RESULTS FROM SINGLE HEN PENS—continued.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
HEAVY BREEDS.							
R. Burns	187	182	245	174	251	311	1,350
Mars Poultry Farm	201	235	212	216	227	217	1,308
E. F. Dennis	228	213	194	254	218	36	1,143
E. A. Smith	181	183	147	194	190	176	1,071
Miss Hinze	161	136	130	171	182	177	957
Oaklands Poultry Farm... ..	213	136	140	124	214	132	959
Kelvin Poultry Farm	137	139	148	191	106	165	886
F. W. Leney	125	147	114	115	114	133	748

A REMARKABLE FOWL FATALITY AND A POISONOUS PLANT.

On the 19th February, 1918, Mr. H. J. Hockings, of Woolloongabba, mentioned the recent occurrence of a remarkable fatality in his fowlyard. During the previous few days, and at the date mentioned, the thirty-seven fowls he had possessed had sickened in a strange manner indeed, and no less than thirty-four of them had died.

The first symptom—as he stated—exhibited by these birds that at the time were well-developed and healthy, was their sudden trembling “like an aspen-leaf,” this quivering in their feathers growing in intensity and speedily so. The strongest and most vigorous of them—a greedily-feeding bird—after this phenomenon had occurred for only half a minute, dropped. Some remained trembling for a minute or more and then fell; seventeen thus collapsing at the expiration of three to four minutes. When once they went down they were perfectly helpless, and not only could not stand, but might even roll over on to their sides; whilst at the same time their heads drooped. In fact (as described) they “looked like wet rags.” In the case of two birds, they were affected whilst still on the perch; and (as happens with birds when in a condition of rest) their toes kept clinched and so they remained stationary thereon. But their heads and necks, however, meanwhile hung down; although these, when touched, curved slightly and slowly upwards, after the manner of those of an injured snake when its death is coming on. Usually, they lay perfectly still upon the ground where they had collapsed, for three or four days. When touched (kicked) during this time, however, they might utter a low squeaking sound—momentarily; and, at the same time, successive waves of motion, raising up the feathers as they proceeded, would creep over their bodies. They would usually at length thus die, within three or four days, although one had even succumbed in as short a time as three minutes after it had been noticed that it was already sick. Of the two that were fixed on their perches, one had remained in this position for five days, and the other four. They then fell off, and gradually, under treatment—the internal administration of castor oil—

developed the faculty of walking. One of these, when but a day had elapsed since it had thus left its perch, was still quite blind; but during the next day it could partly see, picking up grain and small stones indiscriminately. This convalescent bird, however, still remained timid, and thus on being disturbed quickly scuttled away. Its eyes meanwhile were still half-shut and its face red and congested.

No food was found in the crops of dead birds, but their gizzards were more or less full. Their livers were noticed to be pale, blotched, and spotted, and their hearts and parts adjacent to their hearts much congested.

On inquiry, it was elicited that two strange plants had recently grown spontaneously (seeds without being broken up conveyed by birds) on the land where the fowls had been running—one a creeper with red berries and the other a herb. Moreover, the poultry had been noticed to partake of the fruit (seeds) of both.

Our informant meanwhile submitted samples of the plants referred to, and an examination of them prompted the following memorandum, in which the occurrence under notice is attributed definitely to a special agent:—

“ Relative to the fatal sickness that so many of your fowls have recently experienced, and to my suggestion that the symptoms and the history of this occurrence as detailed by you, both indicated the action of a specific poison, I may further add that of the two ‘strange plants’ whose fruit you have noted as having been recently eaten by the fowls in which this fatality and sickness occurred, and that you have submitted, one is named *Rivina* (*Lavissima*)—Fam. *Phytolacaceæ*—and the other *Solanum jasminoides*—Fam. *Solanaceæ*; the latter being the blue-flowered creeper and the former the herbaceous weed.

“ With regard to the possible effect on fowls of feeding on the fruit (seeds) of these, I may state as follows:—

“ 1. *Rivina*.—Notwithstanding that this plant is a member of a plant family whose roots, leaves, and berries are said to contain ‘acrid, vesicant, and drastic substances,’ these have for their principal effect, severe purging; but I am not aware, however, of any such property having been discovered as being possessed by any genus of the *Phytolacaceæ* other than the species of *Phytolacca* itself. Indeed, on the other hand, we are informed by the late Colonial Botanist, Mr. F. M. Bailey, without, however, reference to authority for the statement, that in America the fruit of *R. Lavissima* is actually used as food for birds.

“ 2. *Solanum jasminoides*.—The berries of this plant were formerly pointed out to me by a Queensland resident as having proved poisonous to fowls; and on examining the seeds of these now placed by you at my disposal, I find, on applying a special test (known as Mandelin’s), that the sections show the microchemical reaction for the presence of the toxic principle—*Solanine*.

“ And, I may add, the action of this alkaloid, both on warm and cold-blooded animals, has been described as follows:—‘Solanine paralyses

the central nervous system without affecting the peripheral and voluntary muscles, slows heart and respiration, lessens sensibility, and causes death with convulsions.' (T. Lauder Brunton in 'Pharmacology.')

"On consideration of the symptoms manifested by your sick fowls, and in view of the fact that they had previously partaken of the Solanine—containing fruit of the *Solanum* named—I have but little hesitation in concluding, therefore, that the fatality remarked, and the latter event, stand in the relation of cause and effect.

"This conclusion suggests a line of action to be followed that it is not for me to describe.

"(Signed) HENRY TRYON,

"Vegetable Pathologist, &c.

"21st February, 1918."

Addendum.—Subsequent to the receipt of foregoing memorandum Mr. Hockings stated that he had re-examined the gizzard contents of certain of the dead fowls, and that these comprised millions of seeds that he had first taken for grass seeds (*Paspalum dilatatum*), but that he afterwards found, on comparison being made, were actually those of the red-berried creeper (*Solanum scaberrimum*). Portions of the flesh of its fruit were also discernible amongst them.

THE POULTRY INDUSTRY.

By J. C. BEARD, Poultry Instructor.

HELPFUL HINTS FOR BEGINNERS.

In selecting ground for the keeping of poultry avoid, if possible, heavy clay or black soils. Light sandy soil or loam is far preferable, making less work with better results.

Choose sheltered ground for poultry-keeping, not exposed to the bleak westerly winds, a mistake so often made at the commencement. All shelters should be placed so as to have a north or north-easterly aspect, and the back and two ends should be boarded close with wire in front.

In taking over a site for poultry-keeping, always see that there is an ample water supply. If outbuildings are already erected, this saves so much capital, as these can be utilised for foodsheds, incubation, and storerooms.

Orchard land is always preferable. The fruit adds to one's income, and the trees do better with poultry running beneath them.

Arrange the floor of the house, even if made up inside with soil, higher than the outside ground, to ensure the same keeping dry. Make all perches movable, and these should be all on one level, not, as in the old style, ladder fashion, and avoid using saplings; sawn timber 3 in. by 1½ in., with top edge a little raised (?). These should be placed on uprights, 2 ft. high, driven into the ground. Cut the head off a 3 in. nail, and drive it in on top of the upright to act as a peg. Bore a small hole through the perch and drop it onto the pegs. These keep the perch in its place, and it is easy to remove the latter when necessary. Keep each end of the perch 1 ft. from the wall.

If fowls will insist on flying out of their pens, cut off short most of the inner flight-feathers on one wing only, leaving the outer flight-feathers intact, otherwise the fowl looks unsightly.

If felt is used on the roofs, this should be tarred once a year, throwing on dust or sand before the tar dries. Creosote is far and away the best preservative for both inside and outside of the houses. No insects can live where this is used, and it acts as a good disinfectant.

Never overcrowd chicken coops, foster-mothers, or fowl-houses, as disease in some form is bound to follow.

When feeding fowls in the morning, care should be taken to give all a portion; those that hang behind and do not readily eat, or remain on the perch, are probably sickening. A careful watch should therefore be kept on them, or disaster may follow.

Rather underfeed birds required for laying and breeding than otherwise. Always remember that overfeeding injures the birds' health, clogs up their system, and prevents all possibility of their producing eggs, as well as unnecessarily robbing your pocket.

Test all eggs, whether under hens or in incubators, on the sixth day, as this saves time in trying to hatch from useless and infertile eggs.

A male bird can always run with a large number of hens when an unlimited run is provided. But when penning is necessary, for heavy breeds from six to eight and of light breeds eight to ten hens are quite sufficient to breed from with good results, provided there is perch room.

Always place the rearers and chicken-coops in a sheltered position (on short grass), moving the coops every day.

See that chicken-coops and houses are free from draughts and are rainproof, otherwise colds, roup, or other diseases will soon make themselves evident.

Never allow chickens of different ages to run together; the largest are sure to rob the younger ones of their food, and the latter then weaken, droop their wings, and die.

In many cases large clusters of white nits will be found at the root of the feathers around the vent; these should be pulled out, burnt, and carbolic oil applied to the parts.

If a hen or pullet will persist in going into the nest-box, not wanting to lay, nor being broody, it is a sure sign she is ailing.

A fowl moping away from others in a secluded corner should be caught and examined for the cause.

Cleanliness is the keynote to success in the management of poultry.

REPLENISHING THE STOCK.

Few breeders realise the need for renewing the stock from year to year, and they wonder why the chickens do not come out strong and healthy. It is impossible to go on from one year to another without a change of blood, as something injurious is sure to result. The subject of breeding and reproducing species is the most complex question which any breeder has to face; but if it is tackled in the right way there need be no fear, either from loss of quality or stamina.

Nearly every breeder has his own method of getting at results, and many of the old hands get there, while some of the novices fail, and then blame the industry. Now it is usual to use pullets for the earliest breeding pens, not because they are most suitable, but because they come on to lay earlier and produce more eggs than the old birds. But if you want thoroughly reliable chickens, with the strongest stamina, they must be bred from hens in the second season. Many people will not buy these birds, and yet, if they want to breed the best chickens, they must use these, with a vigorous cockerel. To use youngsters on both sides may be one way of getting chickens, but it is better to hatch fifty chickens and rear the lot than to hatch a hundred and only raise fifty.

The best exhibition stock will be reared from hens one year or two years old, even if a cockerel is used; the right thing is to use a male which is full of vigour and fully developed. To breed from immature stock is but to court failure from the start, and have a lot of trouble in the raising. The eggs from the second-year birds will do better and make larger birds, and will be more suitable for breeding another year. I have known good results from cockerels and pullets when these birds have been bred from old stock, which proves that the vigour is handed down for at least the first generation.

There is often failure in using the same cockerel too long in the same pen, and though he may fertilise the eggs, the germ is not strong enough to hatch out a vigorous chick. The subject of breeding needs more care and thought than is usually given by the novice. What you need are chickens, and it is not enough to get fertile eggs, for if the germ therein is weak, the chick will probably not hatch out; and even should it do so, it will only live a short time. Now, by the keeping of the one cock in the pen all the season, this is what happens: He is worked too long and gets weaker as time goes by; hence the breeding results are far from satisfactory.

If you use one male bird for a month, it will be all the better to give him a rest; but as this means two cockerels for each pen, the small breeder cannot carry out the idea. But he must do the next best thing. Supposing he has only one cock, and that it is from him that he has to get all his chickens, then the cock must be kept in good form, and this can best be done by generous feeding. I have known of the method of driving the hens into the house and giving the cock an extra feed outside; but then he should not be kept in the pen too long. To keep setting eggs without raising chickens is so much waste of time and labour, and the object should be to only set the number required and to see that each egg produces a chick.

The ordinary farmer has a very good way of dealing with his stock if he would only keep it up and just breed when the male birds are at their best. As a rule, the hens all run loose round the farm, and roost together; hence there is no attempt at a breeding-pen, but what chickens are hatched must come from this one lot. When there is a number of hens, he buys, say, three male birds just when he is ready for breeding, and if these have run together there will not be any fighting when they are all put down with the hens, which use the one roost. By this means the whole of the eggs collected are fertilised, and any of them will be good enough to set. Probably his hatching extends over a period of two months, and then it is over. During this time all the eggs should be fertile and the chicks come out healthy and strong. After this time the male birds are killed off, and the next season a fresh lot is got in and the same procedure gone through. As these birds live under the healthiest conditions, with plenty of exercise, both adults and youngsters should do well, and at least 90 per cent. of the eggs be fertile, hatch out, and grow into good adult stock.

All breeds are not alike, and some varieties are more active than others; these, consequently, will take more hens than breeds like the Orpington or Asiatic varieties. Any of the Leghorn family will be more fertile with twelve hens than some Black Orpingtons will be with only three, although, as a rule, Buff and White Orpingtons are more vigorous, and a good cockerel will fertilise all the eggs from eight hens. Wyandottes are fairly active, and the best laying sorts are small birds, which prove fertile up to ten hens, though, if left too long together, the hens should be reduced, or the cockerels should be given a rest. The safest rule for breeding is to use present-year males with two-year hens, and then good results may reasonably be expected.

SUGAR AS A MEAT PRESERVATIVE.

There is nothing new in the idea of employing sugar instead of salt as a preservative for meat. We have in past years had frequent opportunities of noting the effects of sugar on hams. The hams were placed in a pickle, if we may so call it, of sugar and molasses. The fresh hind quarters of the pig were first well rubbed with powdered sugar, and were then placed in the saccharine solution and left undisturbed for some weeks. When cooked, the meat did not present that red and white appearance of the brine-cured article, but more resembled fresh pork. Yet the taste was precisely the same as that of ham, albeit a little sweeter. In connection with this, we learn that experiments have been made under the direction of the French Minister for Agriculture, which demonstrate that sugar is a good agent for meat preserving, and possesses some advantages over salt. It is pointed out that the latter absorbs a portion of the nutritive substances and of the flavour of the meat. When an analysis is made of a solution of salt dissolved by water contained in meat, albumenoid bodies, extractive substances, potassa, and phosphoric acid are found. Salt deprives meat of these substances so much the more readily in proportion as it enters the tissues more deeply or acts for a longer time. The result is that the meat, when taken from the saline solution, has lost nutritive elements of genuine importance. Powdered sugar, on the contrary, being less soluble, produces less liquid. It forms round the meat a solid crust, which removes very little water from it, and does not alter its taste. Thus preserved it is sufficient that the meat be immersed in water before using it. The report declares that although this treatment costs a little more than preservation by salt, account must be taken of the final result, and of the loss prevented, which offsets the difference in cost between the two preservatives.

The Orchard.

PICKLING OLIVES IN ITALY.

The great cost of picking olives in Australia would appear to bar olive-growing in Australia. But why should not the Italian method be tried? In Calabria, in Italy, where there are very extensive olive groves, the proprietors dig out a kind of huge saucer round the trees, about 1 ft. deep towards the centre, sloping up to the surface. The ripe olives, as they drop from the trees, roll down the sides of the depression, and are daily shovelled out with wooden shovels. This process might overcome the picking difficulty in Australia. In Italy the trees are also beaten, when a whole army of women and children is employed picking them up. Of course, in Italy, wages are very low. Women earn 6d. per day; boys 4d., without rations; ordinary farm labourers are paid 7d. per day; and a shepherd will work for 4s. a month and rations of rye bread and skim milk, from dawn to dark. We would like to see the cultivation of olives established in Queensland, but would rather be without Queensland-grown olives than see them grown for what can but be starvation wages.—[Ed. "Q.A.J."]

At Mildura, Victoria, a few years ago, 25 tons of olives produced 875 gallons of oil, worth at the time 7s. per gallon, and pickers received 3s. per 112 lb. The profit amounted to £8 6s. 3d. per acre. Pickers, since the war, were paid £6 to £10 per ton, but the price of olives and oil also advanced, the manufacturers paying £13 per ton for olives. The price of olive oil in the United States in July, 1917, was 6s. 8d. per gallon.

Mr. Beaumont, Manager of the Government Orchard, Blackwood, South Australia, writing on diseases of the olive, says:—

"As far as disease goes, the olive is a very hardy tree, and is not easily injured, but its greatest scourge is the olive scale, which undoubtedly spoils the beauty and usefulness of the tree, but it is easily dealt with, and I think it is to be regretted that trees, even within the parks of Adelaide, are allowed to go uncared for, and thus to spread the trouble far and wide. On the secretions from the olive scale, the "sooty fungus" which we are all so familiar with, exists. Unfortunately, this scale and the fungus frequently attack other fruits and flowering shrubs. An occasional spraying with kerosene soap wash will clean the trees effectively.

The curculio beetle is fond of the olive, but it may be checked with arsenate of lead 1 lb. to 5 gallons to 10 gallons of water."

He further gives the following figures as to production, consumption, etc., in Australia: "One ton of olives should yield 35 gallons to 45 gallons of oil. A grove of 14 acres of trees, now 30 years old, has averaged 450 cwt. of olives per acre for 20 years, the annual yield varying, of course, with the seasons. Simply let me tell you that the olives are crushed thoroughly so as to free all the oil contained, the crushed product is placed in mats of esparto grass, and subjected to pressure, say about 300 lb. The mass is then broken up, and warm water added, and is again pressed, perhaps three or four times, and up to a pressure of 1,000 lb. The oil and water are separated as soon as possible after being released, and the oil is either filtered or allowed to settle, according to the method adopted at the various factories.

"Our consumption of oil is at present about 60,000 gallons, and we produce about 14,000 gallons, so there is room for improvement, and when we allow for the further fact that we import about 300,000 gallons of cheap cotton seed and colza oil, we will find even a greater reason for extending the culture of the olive. Then there is the preparation of the ripe olive as a food, and the green olive as an appetizer. Here again is great scope for enterprise. Olive oil is a powerful food, and is a splendid substitute for animal fat, and has practically no waste. There is nothing better for the frying of foods. It is a fine preservative; we are all acquainted with its use in tinning fish, etc.

"As a medicine it is most useful, either internally or externally; it will heal cuts and prevent chapping; it is a true remedy for constipation; it is of great assistance to anæmic people in forming new blood, and has been strongly recommended as a food to persons suffering from diabetes, who are not able to assimilate starchy foods; in fact, olive oil and ripe olives are invaluable, though little understood, adjuncts to health, and when the price charged is reduced to something within reason, there is no doubt they will come into general use."

Botany.

WEEDS AND POISONOUS PLANTS OF THE ATHERTON TABLELAND.

By C. T. WHITE, Government Botanist.

In January last, following instructions received from the Minister for Agriculture (Hon. Wm. Lennon), I paid a visit to the Atherton Tableland area, at the request of the Eacham Shire Council, for the purpose of inspecting properties where losses amongst stock had occurred, supposedly from eating poisonous weeds or scrub, and at the same time to make as complete a collection as possible of all plants known to be or suspected of being poisonous to stock; also all noxious weeds growing in the Shire, for exhibit at the next show to be held at Malanda under the auspices of the local Agricultural, Pastoral, and Industrial Society; hence specimens of most of those here noticed will be later forwarded on for that purpose.

The following is a list, with brief notes attached, of all weeds observed, and which were thought worth bringing under notice.

In all newly opened or comparatively new scrub areas, losses amongst stock from eating poisonous plants are likely to occur, especially where the secondary scrub growth has not yet been got rid of. Owing to the difficulty of accurately determining such growth, and our lack of knowledge on the properties of so many of our native plants, the subject is an exceedingly difficult one to handle.

It will be seen from the following list, however, that the area dealt with does not contain any very great number of definitely known poisonous plants, and the majority of those noticed, such as Bean-tree, Peach-leaf Bush, &c., being ones well known to stockowners.

Where reference is made to articles in the "Queensland Agricultural Journal," these can generally be had in reprint form from the Department upon application to the Under Secretary.

Apart from its local interest the following list will be found to have several records that will be of interest to the systematic botanist:—

1. *Stephania hernandiæfolia* (Tape Vine).—A common climber; all parts contain a poisonous alkaloid; an illustrated article with full information will be found in this Journal for October, 1917.

2. *Legnephora Moorei*.—On the Atherton Tableland this vine is known as "Native Grape," owing to the similarity in appearance of the carpels (fruit) to ordinary table grapes. It is closely allied to *Stephania*, and Dr. T. L. Bancroft found the root-bark to contain an active poisonous principle. The plant is often eaten by cattle and, as in *Stephania*, the poisonous principle probably extends through the whole plant. I am informed that children have been made violently ill through eating the fruit.

3. *Lepidium rudérale* (Pepper Grass or Wild Cress).—A rather common herb, with a strong biting cress or turnip taste; a bad weed to taint milk.

4. *Portulaca oleracea* (Pig Weed).—A common garden and cultivation weed; a useful fodder and pot herb; seed ground up into flour was at one time largely used by the inland aborigines for food.

5. *Malvastrum tricuspidatum*.

6. *Sida rhombifolia* (synonym—*Sida retusa*).

7. *Sida acuta*.

These three plants are all very common. No. 6 is the one generally known as *Sida retusa* and is the only one that should be properly so-called; Nos. 5 and 7 are commonly known as bastard *Sida retusa*. The *Malvastrum* is a lower-growing weed than the two *Sidas*, with rough stems, and is useless as a fodder; it is very common in cultivation paddocks, calf-pens, &c.

8. *Sida cordifolia* (Flannel Weed or White Burr).—Recently gazetted as a noxious weed throughout the State; occurs here and there, but not seen in any great quantity; it is one of the commonest and worst weeds about the Northern coastal towns, such as Townsville, Cairns, &c. An illustrated article on it will be found in this Journal for August, 1917.

9. *Urena lobata* (Chinese Burr or Pink Burr).—Probably the commonest weed; a native plant, but is widely spread over the tropical countries of the world.

10. *Triumfetta nigricans* (Black Burr).—I only saw one or two clumps of this. It can be distinguished by its small yellow flowers and by the carpels or "burr" having long, rather soft processes.

Triumfetta rhomboides, which is the common Chinese Burr of the coast, I did not notice; but it probably occurs here and there. *Urena lobata* also occurs on the coast, and is also known as Chinese Burr. In Western Queensland the name of Chinese Burr is given to a totally different plant—*Bassia Birchiei*, which is not found outside of Australia.

11. *Zanthoxylum veneficum* (Prickly Ash).—A common tree with a bright yellow wood, prickly stem, and glossy leaves, often with a reddish tinge. Commonly comes up in paddocks as scrub undergrowth and often simply known as "Prickly Bush." Dr. T. L. Baneroff, writing on this species, stated that the bark contained a poisonous principle as toxic as strychnine. As this probably extends to the leaves and as, moreover, cattle seem to readily eat them, the plant should be destroyed where seen.

12. *Oxalis corniculata* (Wood Sorrel or Sour Grass).—A little creeping clover-like plant with small yellow flowers; of no particular importance.

13. *Castanospermum australe* (Bean-tree, or Moreton Bay Chestnut).—The large brown seeds found lying under the tree are often the cause of mortality amongst stock. According to Dr. Greshoff the leaves contain

the same poisonous principle as the seeds, viz., saponin, and are likewise harmful to stock.

14. *Phaseolus semierectus*.—Was introduced as a fodder plant. I noticed a few plants about Atherton; of no particular importance.

15. *Crotalaria Mitchellii*.—A Rattlepod. A native plant more or less of a weed in many localities. Has been suspected of poisoning stock; but seldom, if ever, seems to be touched by them.

16. *Cassia laevigata* (Arsenic Bush).—One of the commonest weeds of the tableland; probably not poisonous, but would purge stock if eaten; but seldom, if ever, touched by them. It is a native of tropical America and tropical Africa, but has been established in Queensland for some years and is now a common weed of scrub areas from the Tweed northwards. This is different from the “Arsenic Plant” of Irvinebank and adjacent country, which is *Hibbertia Bennettii*.

17. *Cassia occidentalis* (Coffee Senna).—One of the commonest naturalised species of Cassia. An illustrated article dealing with it will be found in this Journal for January, 1916.

18. *Passiflora fœtida*.—“Love-in-a-mist” Passion Flower.

19. *Passiflora Herbertiana*.—Native Passion Vine.

Both these contain prussic acid and are therefore poisonous. The former can easily be told by its white flower and from the fruit being enclosed in a feathery calyx; the native one is a more robust, stronger-growing species with green fruit about the same size as or often a little bigger than the common passion fruit (*Passiflora edulis*).

20. *Bryonia laciniosa* (Bryony or Wild Melon).—A common vine in secondary growth and on the edge of scrubs; can easily be recognised by its red fruit with white, wavy streaks; the vines have often been accused of poisoning stock, and cases are on record where children have eaten the fruit with fatal results.

21. *Richardsonia scabra* (Mexican Clover).—A useless plant; has been praised as a fodder, but our experience with it in Queensland points to it being one of the most aggressive of pests. On the Atherton Tableland it goes under the name of “Fodder weed,” the belief being that it was imported there with fodder imported during the last dry spell. Mr. Chas. Hampden informs me that it even got ahead of *Paspalum* on his place, which gives some idea of its pertinacity.

22. *Dichrocephala latifolia*.—This small native plant is a common weed on scrub tracks, roadsides, &c.; of no particular importance.

23. *Ageratum conyzoides* (Billygoat Weed or Blue Top).—Very common everywhere; introduced as a garden plant.

24. *Erigeron canadensis* (Canada Fleabane).—A North American plant; a very common weed in Queensland; in appearance very similar to the preceding.

25. *Erigeron linifolius* (Rag Weed).—A very tall-growing weed of ragged appearance; in some places known as “Cobbler’s Pegs” owing to

the sharp woody stumps left after mowing the plant down having power enough to penetrate boot leather. This latter name is, however, almost universally given to *Bidens pilosa*. These species of *Erigeron* are especially weeds of cultivation.

26. *Bidens pilosa* (Cobbler's Pegs).—A very common weed.

27. *Siegesbeckia orientalis*.—A very prevalent weed; about Yungaburra called "Bastard Nettle" on account of the leaf bearing some slight resemblance to the small stinging nettle (*Urtica incisa*). On the Northern Rivers of New South Wales, I am informed, it goes under the name of "Pitchfork." It belongs, of course, to a very different family from the nettles and possesses no stinging properties.

28. *Acanthospermum hispidum* (Star Burr).—Too well known to need description; first made its appearance about Townsville about fourteen years ago; now one of the most troublesome pests of the North.

29. *Galinsoga parviflora* (Yellow Weed).—A South American plant which is now a common weed in the Australian States, principally of garden and field cultivation; an excellent green food for poultry.

30. *Erechthites valerianifolia* (Federal Weed or Commonwealth Weed).—So called because it first made its appearance about the first year of the Australian Commonwealth; now a common weed of scrub land from the Tweed to the Cairns and Atherton districts; a pest sometimes, on account of its rapid and dense growth in new clearings preventing a good burn off; an excellent fodder; native of South America.

31. *Erechthites Atkinsonæ*.—A native plant somewhat resembling the Federal Weed, very common in New South Wales and Southern Queensland; not previously recorded from the North; often comes up very thickly in newly felled scrub, and has no advantages as a fodder to recommend it like the Federal Weed; by some, it is called "Rag Weed," a sobriquet applied to several different plants in Queensland.

32. *Emilia sonchifolia*.—A small weed with purple flower-heads, otherwise resembling a small growth of the common Sow or Milky Thistle; of no particular importance.

33. *Sonchus oleraceus* (Sow Thistle or Milky Thistle).—A cosmopolitan weed.

34. *Cnicus lanceolatus* (Spear or Scotch Thistle).—Getting a good hold here and there; one of the worst of our introduced pests. The true heraldic thistle of Scotland is *Onopordon acanthium*, a species which, so far, has not made its appearance in Queensland, though naturalised in the Southern States.

35. *Scaevola enantophylla* (Snake Vine).—Several residents pointed this out to me as a plant poisonous to stock, and Mr. C. Hampden, of Rockley's Pocket, told me that he had more than once noticed its effect on stock. I brought down a quantity, but owing to the hot, moist weather experienced it did not reach Brisbane in a condition suitable for chemical examination. It is a very different plant to those which go under the name of "Snake Vines" in Southern parts, and which belong to the genus *Hibbertia*.

36. *Asclepias curassavica* (Red Head or Milky Cotton Bush).—Rather common here and there; generally regarded as poisonous to stock. An illustration and full account of this weed will be found in this Journal for December, 1898.

37. *Gomphocarpus physocarpus* (Wild Cotton).—A tall-growing aggressive weed, only noticed in one or two places; easily recognised by its balloon-like pods full of dark-brown seeds, with a tuft of fine, silky cotton attached; when broken, any part of the plant exudes a milky juice. Another species of *Gomphocarpus* commoner in Queensland, but which I did not see on the tableland, is *G. fruticosus*. An illustrated article on these two weeds appeared in this Journal for August, 1916.

Asclepiadea.—Belonging to the same natural order or family (*Asclepiadea*) as the two last-mentioned plants. *Asclepias* and *Gomphocarpus* are a number of scrub vines often seen in paddocks climbing over fallen logs, large stumps, &c. These vines, though not definitely known to be poisonous, should be destroyed where seen, as the family is a dangerous one, containing a number of poisonous plants. They can generally be distinguished by the following characteristics:—The leaves are opposite on the stem; the stem and often any parts of the plants readily exude a milky juice when cut; the seed-pods (follicles) are full of seeds with long tufts of silky white hairs attached.

38. *Cynoglossum australe* (Forget-me-not).—A native herbaceous weed; fairly common; bears long branches of white or bluish forget-me-not-like flowers, followed by small 4-lobed burrs; though a burr plant, not a particularly aggressive species.

Solanum.—A very large genus of plants widely distributed over the world; contains such well-known plants as the Potato, Egg Fruit, &c. On the tableland I noticed as weeds about half a dozen indigenous species; quite a number of our native species are more or less troublesome weeds in different parts of the State, and often go under the vernacular of "Potato Bushes."

39. *Solanum nigrum** (Blackberry or Black Currant).—A common weed; the green plant suspected as being poisonous to stock, but seldom touched by them; the fruits are often eaten cooked without any ill effects.

40. *Solanum aviculare* (Kangaroo Apple).—A large, succulent species with berries about the size and shape of a pigeon's egg; a handsome plant in its young stage, bearing large deeply-lobed leaves; hence on the tableland and elsewhere it commonly, though of course erroneously, goes under the name of "Castor Oil Bush." Dr. T. L. Bancroft found the plant to contain a volatile alkaloid poison.

41. *Solanum verbascifolium* (Wild Tobacco).—A tall much-branched shrub with densely hairy leaves, white flowers, and bunches of round berries; a common weed of practically all coastal scrub country in Queensland; contains a poisonous alkaloid; generally goes under the

* According to a recent research by Mr. E. Cheel, there are three distinct species or subspecies which have gone under the name of *Solanum nigrum* in Australia; according to his classification, the common species that occurs on the tableland would be *S. pterocaulon*.

local name above given, though we have several sorts of *Nicotiana* (true tobaccos) native to Queensland: it is these latter that are so often recorded as poisoning stock on the Downs and Western country.

42. *Solanum aculeatissimum* (Devil's Apple).—A very thorny species with white flowers followed by bright scarlet fruits about 1 in. in diameter.

43. *Solanum viride*.—A very common shrub in the scrubs, especially along the edges and roadsides where clearings have been made; attains a large size.

44. *Solanum sporadotrichum*.—A very prickly species; common.

45. *Solanum species* (Dirran Curse).—About Tarzali and the Dirran, a large, scrambling prickly *Solanum* is very common. My specimens do not allow me to make it out specifically, and it is quite possible that it is an undescribed species.

46. *Physalis peruviana* (Cape Gooseberry).—Very common.

47. *Physalis minima* (Wild Gooseberry).—This species is a native, and the fruit, though not known to possess any harmful properties, is very disagreeable in flavour.

48. *Capsicum fastigiatum* (Common Chilli).—One of the commonest naturalised weeds on the tableland.

49. *Duboisia myoporoides* (A Corkwood).—Seldom touched by stock, but supposed to cause blindness and death when eaten; an extract from the leaves has been used in ophthalmic surgery for the purpose of dilating the pupil of the eye, and before the war the leaves were an article of export to Germany, though not, I believe, in any great quantity. J. H. Maiden, Government Botanist of New South Wales, in an article on the plant, stated: "The leaves are poisonous (though not violently so), but accidents from them are rare. Last year, however, two children in the Richmond River district chewed them and suffered from general nervous and muscular derangement accompanied by delirium. They recovered."

50. *Verbascum virgatum* (Twiggy Mullein).—A native of Southern Europe; a naturalised weed in many parts of the State; of no particular importance. An illustration and description are given in this Journal for January, 1918.

51. *Scoparia dulcis*.—A very common weed.

52. *Lantana camara*.—I am informed that *Lantana* has made its appearance in one or two places, but, so far, has been destroyed wherever seen; I did not see any on the tableland myself.

53. *Verbena bonariensis* (Purple Top).—A native of South America; now one of the commonest and most aggressive weeds in Queensland.

Amarantus.—Of this genus we have seven native and two naturalised species. They are all more or less common weeds; form perfectly wholesome fodder, and the young tops of the shoots can be used as a pot herb as a substitute for spinach.

54. *Amarantus spinosus* (Needle Burr).—One of the commonest and most troublesome weeds on the tableland.

55. *Amarantus paniculatus** (Fat Hen).—Very common in cultivation; a large succulent weed, growing to a great height, and commonly known on the tableland as “Fat Hen,” a local name applied in Queensland to a great many plants of the *Amarantaceæ* and *Chenopodiaceæ*.

56. *Amarantus interruptus*.

57. *Amarantus viridis*.

These two species are common weeds of cultivation.

58. *Chenopodium carinatum*.—A strongly scented, low-growing weed generally found in cultivation areas, alongside of fallen logs, in calf-pens, and, in fact, anywhere where the ground has been broken.

59. *Phytolacca octandra* (Ink Weed).—Common everywhere.

60. *Rivina lavis*.—A fairly common weed of the ink weed family, of no particular importance.

61. *Daphnandra repandula*.

62. *Daphnandra aromatica*.—Yellow Sassafras.

In the bark of these two species Dr. T. L. Bancroft found a poisonous principle which possibly extends to the leaves, and as, with other scrub trees, sucker growth may sometimes be seen in paddocks it is perhaps as well to include them in this list.

63. *Euphorbia pilulifera* (Asthma Plant).—A weed of cultivation; tea made from the dried plant gives great relief to people suffering from asthma.

64. *Ricinus communis* (Castor Oil Plant).—A naturalised weed in many parts of Queensland. Persons have been known to have been made violently ill from eating the seeds under the impression that it would have the same effect as castor oil; in addition to the oil, however, the seeds contain a poisonous albuminoid-ricinin.

65. *Homalanthus populifolius* (Bleeding Heart or Native Poplar).—Can hardly be termed a weed, but is noticed here as for some years it was looked upon as poisonous to stock, and the vernacular of “Bulli Poison Bush” was attached to it. Feeding experiments carried out in New South Wales, however, have proved the plant to be in no way harmful, and on the Atherton Tableland it is looked upon as an excellent fodder, several dairymen telling me that they had cut down large supplies of it for their cattle during the last dry spell, and that the stock did well on it.

66. *Trema aspera* (Peach-leaf Poison Bush).—A common shrub. As far as I observed this typical or shrubby form appears to be limited to the forest country; bears small, rough, hairy leaves.

67. *Trema aspera*, var. *viridis* (Peach-leaf Poison Bush).—This form is very common in the scrub country; it can be distinguished by its light-green, thin, almost membranous leaves, and is regarded by many

*I am not too sure as to the plant that is such a common weed in Queensland, and which has always gone under this name, does not better belong to *A. retroflorus*. The two are very closely allied, and I am not absolutely certain to which species our plant more rightly belongs.

dairymen as the worst of the three forms that occur on the tableland. It is worth recording here that H.C.N. has been recorded from the closely allied East Indian *Trema virgata*. Several tests have been made by Mr. F. Smith, B.Sc., and the writer with the different forms in Queensland, but with negative or doubtful results. It is generally conceded that the bad effects are worse in a dry time when other feed is scarce, and it is more than likely that the action of the plant is a mechanical one, causing severe constipation.

68. *Trema amboinensis* (Peach-leaf Poison Bush).—This form attains tree size. It can usually be distinguished by its large, thick, densely hairy leaves, sometimes measuring nearly 1 ft.

69. *Urtica incisa* (Stinging Nettle).—Common on the edge of scrubs, roadsides, new clearings, &c. A native plant; generally known in Queensland (erroneously) as the “English Nettle.”

70. *Laportea gigas* (Stinging Tree).—Very common; though apparently the same species as occurs in New South Wales and Southern Queensland, in the tableland area I never saw any that attained a size bigger than what one could call a large shrub; in the South it grows to a tree of about 100 ft. high. Dr. J. L. Petrie, working on the stinging property of this plant, stated that the sting was undoubtedly due to free acid existing in a concentrated form in the hairs. He further states: “Common nettle plant contains 0.002 per cent formic acid; nettle tree contains 0.179 per cent. free acid (0.002 per cent. formic acid and 0.179 acetic)—that is, *Laportea gigas* contains 90 per cent. more free acid than *Urtica urens*. The amount of strong acid injected under the skin by one of the large hairs is quite a sufficient cause for the severe shock which follows the sting.” The common nettle he refers to would probably possess similar stinging properties to those of *Urtica incisa*.

71. *Laportea photiniphylla* (Glossy-leaf or Shining-leaf Stinging Tree).—Often called “Mulberry-leaf Stinging Tree” on account of the similarity of the leaves to those of the common mulberry.

72. *Laportea moroides* (Gympie Nettle).—Very similar in general appearance to *Laportea gigas*.

73. *Cycas media* (Zamia Palm).—Practically all the Australian members of the order Cycadaceæ are looked upon as the cause amongst stock of the complaint known as “Rickets.”

74. *Bowenia spectabilis* (Zamia Fern or Ricket Fern).—Very common in places, and looked upon as decidedly harmful, having the same effect on stock as other members of the family Cycadaceæ.

75. *Alocasia macrorrhiza*.—Cunjevoi.

76. *Colocasia antiquorum*.—Taro.

These two Aroids are common in wet scrub localities; though eaten after being cooked by the natives, they possess, in addition to a cyanogenetic glucoside (prussic acid), an extremely acrid principle that has a most unpleasant effect on the mouth and throat when the thick root-stock or any other part of the plant is tasted in a raw state.

77. *Paspalum Galmarra* (Russell River Grass).—Very common on the tableland, and generally looked upon there as almost worthless as a fodder; at one time was praised as a dairy grass and introduced into the South, but now never seen there.

78. *Paspalum platycaule* (Carpet Grass).

79. *Paspalum conjugatum* (Johnstone River Grass).

I draw attention to these two grasses, not because they can be termed weeds in the ordinary sense, but owing to the confusion between them. They are to be seen, more often than not, growing intermixed, and no distinction is made between them by dairymen, both going under the name of Johnstone River Grass, and being looked upon more as weeds than useful pasture grasses. This is rather strange, as *Paspalum platycaule* is regarded as one of the best pasture grasses for the tropics.

80. *Panicum sanguinale* (Summer Grass).—A weed of cultivation.

81. *Tricholana Teneriffæ* (Red Natal Grass).—Introduced as a fodder grass, but only of poor value; it is often listed in seedsmen's catalogues as an ornamental species.

82. *Cenchrus australis* (Scotch Lice).—A pestilential burr grass; common along the edge of scrubs, roadsides, &c.; gazetted a noxious weed within the Eacham Shire. The local name is misleading, as the grass is a native of Australia, not an introduction.

83. *Cenchrus echinatus* (Mossman River Grass).—A common tropical pestilential burr grass; not previously recorded from Queensland.

84. *Imperata arundinacea* (Blady Grass).—"Lalang" of the Malay States. Common.

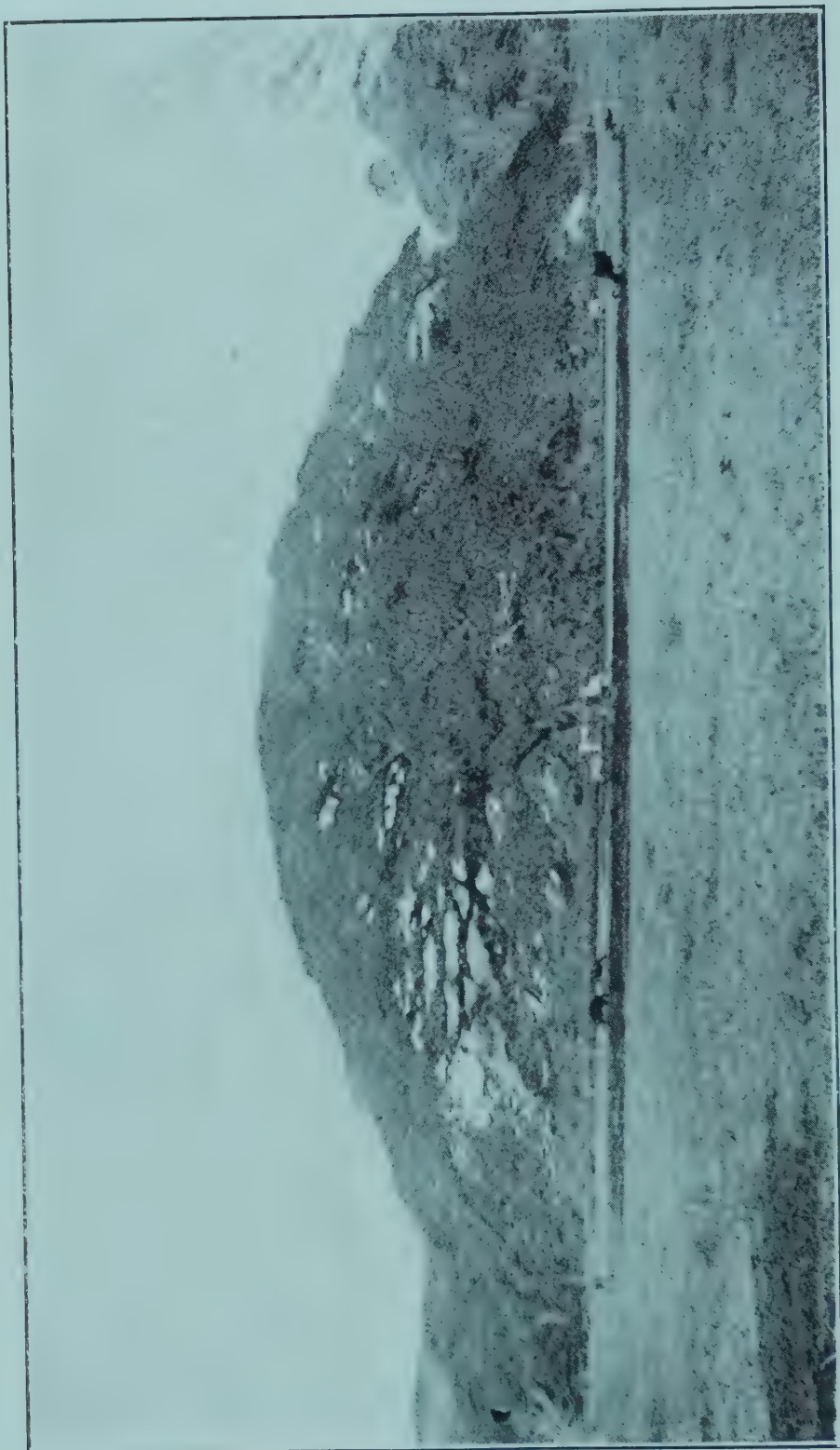
85. *Eleusine indica* (Crowfoot Grass).—Common along roadsides, cultivation areas, and, in fact, anywhere where the land has been broken; it contains a fair quantity of prussic acid, and, though a nutritious fodder, may, perhaps, be the cause of death when eaten in fair quantities. An illustration and description will be found in this Journal for August, 1914.

86. *Pteris aquilina*, var. *esculenta*.—Common Bracken.

87. *Pteris aquilina*, var. *languinosa*.—Woolly Bracken.

Both of these forms occur on the tableland. In Europe and North America the common Bracken has been accused of poisoning stock, but the accounts are conflicting. I have never heard of any of the Australian forms causing harm to stock in any way.

88. *Lepiota dolichaulos* (Toadstool).—In the "Agricultural Gazette" of New South Wales for December, 1909, attention is drawn to this fungus as the probable cause of death among some cattle on the Richmond River. This is the common large toadstool with a cap about the size and shape of an ordinary dinner plate, and which comes up so thickly in paddocks on scrub areas in Queensland. On the Atherton Tableland several dairymen informed me that pigs and other stock eat them greedily without apparently any ill effects.

PLATE 13.—TREE OF PITHECOLOBIUM SAMAN. *Benth.*

Growing in Trinidad, British West Indies. Described in March issue of the Journal, page 94. Spread of branches = 300 feet; area covered by branches = 1 acre 2 roods 19 perches.

Answers to Correspondents.

HOME-CURING HAMS AND BACON.

FARMER'S WIFE, Toowoomba—

We have given several recipes for curing hams and bacon in the Journal. Here is one, recommended in the "Farm Journal," Sydney:—

"The cause of hardness in bacon referred to is due to the excessive use of saltpetre, especially through using it during the first stages of curing. For home curing a suitable recipe is as follows:—Weigh out for each 100 lb. of meat 5 lb. of salt, 2 lb. of brown sugar, and 2 oz. of saltpetre. When the carcass is thoroughly set, cut up and salt lightly; then lay it overnight upon a clean concrete floor or table. By salting lightly is meant that as much salt as will cover the meat comfortably without undue waste be used. Next morning brush the salt off thoroughly; then dry-salt the meat with dry salt and brown sugar rubbed well in daily for three days. On the fourth and fifth days a little saltpetre should be added to the salt and sugar, which should be well rubbed in, especially on the skin. Leave the bacon and hams in the mixture (dry salt and brown sugar) for about three weeks; but they should be turned every day or second day; at the same time continue rubbing during this period. Then wash clean, when the bacon and hams will be ready for smoking, the duration of which depends upon the taste of the manufacturer. After the first week or ten days, it is advisable to brush the salt and sugar off the inner side of the thin parts of the bacon (flaps). Note that dry salting should only be undertaken in cold weather and in a cool place."

W. G. Gray, Ravenshoe, N.Q.—

1. *Re* branding on one side of cattle?—This applies to all registered brands.

2. It is impossible to say at what age a bull becomes of no further use for service, as this varies with the animal, the feeding, and the amount of service he is given?—If properly attended to and not overworked, he may go on until ten or twelve years of age.

3. A defence that a receipt received for a cheque subsequently dishonoured represents complete payment for goods could never be sustained. A person taking a cheque could, in the event of the cheque being dishonoured, sue the debtor for the amount.

REMEDY AGAINST CANE RATS.

THOS. LOVE, Ingham—

With reference to your request for a remedy against cane rats, Mr. H. T. Easterby, General Superintendent of Sugar Experiment Stations, states that considerable success was obtained by Mr. Jodrell, of Innisfail, in the poisoning of rats by grinding up strychnine into a powder and placing it over baits such as bread and butter and cut bananas. Mr. Jodrell anoints his hands with oil of aniseed before preparing the baits. At Mossman pellets of tallow impregnated with strychnine and aniseed oil have been thrown amongst the cane and found to work successfully. Corn boiled in a strong solution of strychnine has also been effectively used in sugar districts.

SOUTHERN FRUIT MARKETS.

Article.						MARCH.
						Prices.
Bananas (Queensland), per case ...	...	...	...	...	...	6s. to 12s.
Bananas (Tweed River), per case ...	...	...	...	...	...	3s. to 14s.
Bananas (Fiji), per bunch ...	...	...	...	...	...	5s. to 6s.
Bananas (G.M.), per bunch ...	...	...	...	...	...	5s. to 6s.
Lemons (local), per bushel-case ...	...	...	...	...	...	...
Mangoes, per case ...	...	...	...	...	...	4s. to 5s.
Mandarins, per case ...	...	...	...	...	...	...
Oranges (Navel), per case ...	...	...	...	...	...	...
Oranges (Queensland), per case ...	...	...	...	...	...	7s. to 14s.
Papaw Apples, per half-case ...	...	...	...	...	...	6s. to 7s.
Passion Fruit, per half-case ...	...	...	...	...	...	4s. to 8s.
Pineapples (Queens), per double-case ...	...	...	...	...	...	8s. to 12s.
Pineapples (Common), per double-case ...	...	...	...	...	...	6s. to 8s.
Tomatoes (Queensland), per quarter case ...	...	...	...	...	...	1s. 6d. to 3s.
Cucumbers, per bushel case ...	...	...	...	...	...	...
Strawberries, per lb. ...	...	...	...	...	...	...

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.						MARCH.
						Prices.
Apples, Eating, per case ...	...	...	...	...	...	3s. to 7s.
Apples, Cooking, per case ...	...	...	...	...	...	3s. to 7s.
Apricots, per case ...	...	...	...	...	...	...
Bananas (Cavendish), per dozen ...	...	...	...	...	...	3d. to 5d.
Bananas (Sugar), per dozen ...	...	...	...	...	...	2d. to 6d.
Cape Gooseberries, per quarter-case ...	...	...	...	...	...	...
Cherries, per box ...	...	...	...	...	...	...
Citrons, per hundredweight ...	...	...	...	...	...	7s. to 8s.
Cocoanuts, per sack ...	...	...	...	...	...	15s. to 25s.
Cumquats, per quarter-case ...	...	...	...	...	...	...
Custard Apples, per tray ...	...	...	...	...	...	2s. 6d. to 4s.
Lemons (Lisbon), per quarter-case ...	...	...	...	...	...	7s. to 10s.
Mandarins, per case ...	...	...	...	...	...	7s. to 10s.
Mangoes, per quarter-case ...	...	...	...	...	...	4s. to 4s. 6d.
Oranges (Navel), per case ...	...	...	...	...	...	8s. to 10s.
Oranges (Seville), per hundredweight ...	...	...	...	...	...	...
Oranges (other), per case ...	...	...	...	...	...	5s. to 10s.
Papaw Apples, per quarter-case ...	...	...	...	...	...	2s. to 2s. 6d.
Passion Fruit, per half-bushel case ...	...	...	...	...	...	5s. to 7s.
Peaches, per quarter-case ...	...	...	...	...	...	2s. to 4s.
Pears, per half-bushel case ...	...	...	...	...	...	...
Peanuts, per lb. ...	...	...	...	...	...	5d. to 7d.
Persimmons, per quarter-case ...	...	...	...	...	...	1s. 8d. to 2s.
Pineapples (Ripleys), per dozen ...	...	...	...	...	...	1s. to 3s. 6d.
Pineapples (Rough), per dozen ...	...	...	...	...	...	1s. to 3s. 6d.
Pineapples (Smooth), per dozen ...	...	...	...	...	...	6d. to 1s. 6d.
Plums, per quarter-case ...	...	...	...	...	...	6s. to 8s.
Rockmelons, per dozen ...	...	...	...	...	...	...
Strawberries, per dozen boxes ...	...	...	...	...	...	...
Tomatoes, per quarter-case ...	...	...	...	...	...	2s. to 6s.
Watermelons, per dozen ...	...	...	...	...	...	...

TOP PRICES, ENOGGERA YARDS, FEBRUARY, 1918.

Animal.	FEBRUARY.	
	Prices.	
Bullocks	£23 5s. to £26 2s. 6d.	
Cows	£15 10s. to £17 15s.	
Cows (Single)	...	
Merino Wethers	42s. 9d.	
Crossbred Wethers	42s.	
Merino Ewes	30s.	
Crossbred Ewes	38s.	
Lambs	37s. 3d.	
Pigs (Baconers)	...	
Pigs (Porkers)	47s. 6d.	
Pigs (Slips)	...	

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF FEBRUARY, 1918, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING FEBRUARY, 1918 AND 1917, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Feb.	No. of Years' Records.	Feb., 1918.	Feb., 1917.		Feb.	No. of Years' Records.	Feb., 1918.	Feb., 1917.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Atherton	9·67	17	9·62	9·83	Nambour	8·96	22	5·67	5·58
Cairns	14·93	36	18·06	6·09	Nanango	4·54	36	2·91	1·68
Cardwell	17·02	46	16·98	22·09	Rockhampton	7·82	31	8·20	5·58
Cooktown	13·61	42	13·48	11·57	Woodford	9·32	31	9·33	3·02
Herberton	7·49	31	10·02	7·79					
Ingham	15·65	26	18·40	23·93	<i>Darling Downs.</i>				
Innisfail	22·07	37	20·07	19·20	Dalby	2·98	48	2·17	3·45
Mossman	15·13	10	15·36	17·95	Emu Vale	2·45	...	1·13	2·73
Townsville	12·16	47	7·12	20·06	Jimbour	3·09	...	0·42	1·68
					Miles	2·75	33	3·36	4·12
<i>Central Coast.</i>					Stanthorpe	3·45	45	0·86	4·29
Ayr	9·43	31	8·30	10·49	Toowoomba	4·57	46	2·26	6·85
Bowen	8·79	47	14·66	12·04	Warwick	3·05	31	2·30	2·57
Charters Towers	4·40	36	11·26	7·45					
Mackay	11·77	47	9·89	18·02	<i>Maranoa.</i>				
Proserpine	10·96	15	13·34	14·15	Roma	3·17	44	0·17	4·88
St. Lawrence	8·26	47	7·49	10·58					
<i>South Coast.</i>					<i>State Farms, &c.</i>				
Biggenden	3·88	...	4·15	2·93	Bungeworgorai	3·02	4	0·45	4·43
Bundaberg	6·45	35	5·62	8·46	Gatton College	3·26	...	1·59	4·01
Brisbane	6·57	67	2·25	1·64	Gindie	2·75	...	5·84	6·17
Childers	6·17	23	8·89	6·73	Hermitage	2·56	...	1·59	2·83
Crohamhurst	15·03	25	7·88	6·97	Kairi	6·18	4	...	8·99
Esk	5·94	31	2·18	3·89	Kamerunga	14·09	...	13·35	7·41
Gayndah	4·26	47	4·95	3·11	Sugar Experiment Station, Mackay	10·37	...	11·77	14·80
Gympie	6·75	48	7·28	2·84	Warren	3·92	4	10·96	7·25
Glasshouse M'tains	9·50	10	9·03	3·90					
Kilkivan	5·24	39	4·07	2·33					
Maryborough	6·67	47	7·39	6·28					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for February this year, and for the same period of 1917, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Officer.

Farm and Garden Notes for May.

FIELD.—During this month, the principal work in the field will be the sowing of wheat, barley, oats, rye, and vetches. There is no time to lose now at this work. Potatoes should be hilled up. Cut tobacco. The last of the cotton crop should now be picked, the bushes being stripped daily after the dew has evaporated. Cotton-growers are notified that cotton-ginning and baling machinery has been installed on the premises of the Department of Agriculture and Stock in William street, where seed cotton will be received by the department from the growers, to whom an advance of 1¾d. per lb. will be paid. The cotton will then be ginned, baled, and marketed in the best market, and whatever balance to credit is shown when account sales are received will be distributed amongst the suppliers according to the amount of cotton supplied by them. Only bare expenses of preparing the shipments and freight, if the cotton is exported, will be deducted. Thus it will be seen that cotton-growers will have a sure market for their produce. Every effort should be made to ensure feed for stock during the winter by utilising all kinds of green fodder in the form of silage or hay. Those who own dairy stock will be wise to lay down permanent grasses suitable to their particular district and soil. A few acres of artificial grass, notably Rhodes grass, will support a surprisingly large number of cattle or sheep in proportion to acreage. Couch grass in the West will carry ten to twelve sheep to the acre. Coffee-picking should now be in full swing, and the berries should be pulped as they are picked. Strawberries may be transplanted. The best varieties are Pink's Prolific, Aurie, Marguerite, Annetta, Phenomenal, Hautbois, and Trollope's Victoria. Aurie and Marguerite are the earliest. In some localities, strawberry planting is finished in March, and the plants bear their first fruits in August. In others, fruit may be gathered in July, and the picking does not end until January.

KITCHEN GARDEN.—Onions which have been planted in seed beds may now be transplanted. The ground should long since have been thoroughly cleaned, pulverised, and should be rolled previous to transplanting. Onions may still be sown in the open on clean ground. In favourable weather plant out cabbages, cauliflowers, lettuce, leeks, beetroot, endive, &c. Sowings may also be made of all these as well as of peas, broad beans, kohlrabi, radishes, spinach, turnips, parsnips, and carrots. Dig and prepare beds for asparagus.

FLOWER GARDEN.—Planting and transplanting may be carried out simultaneously during this month in showery weather; the plants will thus be fully established before the early frosts set in. Camellias and gardenias may be safely transplanted, also such soft-wooded plants as verbenas, petunias, pentstemons, heliotrope, &c. Cut back and prune all trees and shrubs ready for digging. Dahlia roots should be taken up and placed in a shady situation out of doors. Plant bulbs such as anemones, ranunculus, snowflakes, freesias, ixias, watsonias, iris, narcissus, daffodils, &c. Tulips will not suit the Queensland climate, but hyacinths may be tried, although success is doubtful. All shades and screens may now be removed to enable the plants to get the full benefit of the air. Fork in the mulching, and keep the walks free from weeds. Clip hedges and edgings.

Orchard Notes for May.

THE SOUTHERN COAST DISTRICTS.

The advice given respecting the handling and marketing of citrus fruits in the last two numbers of this Journal applies with equal force to this and the following months. Do not think that you can give the fruit too much care and attention; it is not possible, as the better they are handled, graded, and packed the better they will carry, and the better the price they will realise.

Continue to pay careful attention to specking, and fight the blue mould fungus everywhere. Don't let mouldy fruit lie about on the ground, hang on the trees, or be left in the packing-shed, but destroy it by burning. Keep a careful lookout for fruit fly, and sweat the fruit carefully before packing. If this be done, there will be little fear of the fruit going bad in transit or being condemned on its arrival at Southern markets. Where the orchard has not been already cleaned up, do so now, and get it in good order for winter. Surface working is all that is required, just sufficient to keep moisture in the soil; keep down undergrowth, and prevent the packing of the surface soil by trampling it down when gathering the fruit.

Keeping the orchard clean in this manner enables any fallen fruit to be easily seen and gathered, and it need hardly be stated, what has been mentioned many times before, that diseased fruit should on no account be allowed to lie about and rot on the ground, as this is one of the most frequent causes of the spreading of many fruit pests.

May is a good month to plant citrus trees, as if the ground is in good order they get established before the winter, and are ready to make a vigorous growth in spring.

Don't plant the trees, however, till the land is ready, as nothing is gained thereby, but very frequently the trees are seriously injured, as they only make a poor start, become stunted in their growth, and are soon overtaken by trees planted later, that are set out under more favourable conditions. The land must be thoroughly sweet, and in a good state of tilth—that is to say, deeply worked, and worked down fine. If this has been done, it will probably be moist enough for planting; but should there have been a dry spell, then, when the hole has been dug and the tree set therein, and the roots just covered with fine top soil, 4 to 8 gallons of water should be given to each tree, allowed to soak in, and then covered with dry soil to fill up the hole. In sound, free, sandy loams that are naturally scrub soils, holes may be dug and the trees planted before the whole of the ground is brought into a state of perfect tilth. It is, however, better to do the work prior to planting, as it can then be done in the most thorough manner; but if this is not found possible, then the sooner it is done after planting the better. If the land has been thoroughly prepared, there is no necessity to dig big holes, and in no case should the holes be dug deeper than the surrounding ground either is or is to be worked. The hole need only be big enough to allow the roots to be well spread out, and deep enough to set the tree at the same depth at which it stood when in the nursery. Plant worked trees 24 to 25 ft. apart each way, and seedlings at least 30 ft. apart each way.

Towards the end of the month cover pineapples when there is any danger of frost; dry blady grass or bush hay is the best covering. Keep the pines clean and well worked—first, to retain moisture; and, secondly, to prevent injury from frost—as a patch of weedy pines will get badly frosted when a clean patch alongside will escape without any serious injury.

Slowly acting manures—such as meatworks manure when coarse, boiling-down refuse, farm manure, or composts—may be applied during the month, as they will become slowly available for the trees' use when the spring growth takes place; but quickly-acting manures should not be applied now.

THE TROPICAL COAST DISTRICTS.

May is a somewhat slack month for fruit—pines, papaws, and granadillas are not in full fruit, the autumn crop of citrus fruit is over, and the spring crop only half-grown. Watch the young citrus fruit for Maori, and when it makes its appearance spray with the sulphide of soda wash. Keep the orchard clean, as from now till the early summer there will not be much rain, and if the orchard is allowed to run wild—viz., unworked and dirty—it is very apt to dry out, and both the trees and fruit will suffer in consequence.

Bananas should be kept well worked for this reason, and, though the fly should be slackening off, every care must still be taken to prevent any infested fruit being sent to the Southern markets.

Citrus fruits can be planted during the month, the remarks *re* this under the heading of the Southern Coast Districts being equally applicable here.

THE SOUTHERN AND CENTRAL TABLELANDS.

Get land ready for the planting of new deciduous orchards, as, although there is no necessity to plant so early, it is always well to have the land in order, so as to be ready to plant at any time that the weather is suitable. The pruning of deciduous trees can commence towards the end of the month in the Stanthorpe district, and be continued during June and July. It is too early for pruning elsewhere, and too early for grapes, as a general rule. Keep the orchard clean, particularly in the drier parts. In the Stanthorpe district the growing of a crop of blue or grey field peas, or a crop of vetches, between the trees in the older orchards is recommended as a green manure. The crop to be grown as a green manure should have the soil well prepared before planting, and should be manured with not less than 4 cwt. of phosphatic manure, such as Thomas phosphate, or fine bonedust, per acre. The crop to be ploughed in when in the flowering stage. The granitic soils are naturally deficient in organic matter and nitrogen, as well as phosphoric acid, and this ploughing in of a green crop that has been manured with a phosphatic manure will have a marked effect on the soil.

Lemons will be ready for gathering in the Roma, Barcaldine, and other districts. They should be cut from the trees, sweated, and cured down, when they will keep for months, and be equal in quality to the imported Italian or Californian fruit. If allowed to remain on the trees, the fruit becomes over-large and coarse, and is only of value for peel. Only the finest fruit should be cured; the larger fruit, where the skin is thicker, is even better for peel, especially if the skin is bright and free from blemish; scaly fruit, scabby, warty, or otherwise unsightly fruit is not suitable for peel, and trees producing such require cleaning or working over with a better variety, possibly both.

The remarks *re* other citrus fruits and the work of the orchard generally, made when dealing with the coast districts, apply equally well here, especially as regards handling the crop and keeping down pests.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE.

1918.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		PHASES OF THE MOON.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	4.57	6.46	5.21	6.41	5.41	6.19	5.58	5.46	The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania.
2	4.58	6.46	5.22	6.41	5.41	6.18	5.59	5.45	
3	4.59	6.46	5.23	6.40	5.42	6.17	5.59	5.44	H. M.
4	4.59	6.46	5.24	6.40	5.43	6.16	6.0	5.43	
5	5.0	6.46	5.25	6.39	5.44	6.15	6.0	5.42	5 Jan. ☾ Last Quarter 9 49 p.m.
6	5.1	6.47	5.25	6.39	5.45	6.14	6.1	5.41	13 „ ● New Moon 8 36 a.m.
7	5.2	6.47	5.26	6.38	5.45	6.13	6.1	5.39	20 „ ☾ First Quarter 12 38 „
8	5.3	6.47	5.27	6.37	5.46	6.12	6.2	5.38	27 „ ○ Full Moon 1 14 p.m.
9	5.3	6.47	5.28	6.36	5.46	6.11	6.2	5.37	The Moon will be at Perigee on 15th, Apogee on 3rd and 31st.
10	5.4	6.48	5.29	6.35	5.47	6.10	6.3	5.36	
11	5.5	6.48	5.29	6.35	5.47	6.9	6.3	5.35	4 Feb. ☾ Last Quarter 5 52 p.m.
12	5.6	6.47	5.30	6.34	5.48	6.8	6.4	5.34	11 „ ● New Moon 8 5 „
13	5.6	6.47	5.31	6.33	5.48	6.7	6.4	5.33	18 „ ☾ First Quarter 10 57 a.m.
14	5.7	6.47	5.32	6.32	5.49	6.6	6.5	5.32	26 „ ○ Full Moon 7 35 p.m.
15	5.8	6.47	5.32	6.32	5.49	6.5	6.5	5.31	The Moon will be at Perigee on 12th, Apogee on 28th.
16	5.9	6.47	5.33	6.31	5.50	6.3	6.6	5.30	
17	5.9	6.47	5.34	6.30	5.50	6.2	6.6	5.29	6 Mar. ☾ Last Quarter 10 44 a.m.
18	5.10	6.47	5.35	6.29	5.51	6.1	6.7	5.28	
19	5.11	6.47	5.35	6.28	5.51	6.0	6.7	5.27	13 „ ● New Moon 5 52 p.m.
20	5.12	6.46	5.36	6.28	5.52	5.59	6.8	5.26	19 „ ☾ First Quarter 11 30 „
21	5.13	6.46	5.37	6.27	5.52	5.58	6.8	5.25	28 „ ○ Full Moon 1 33 „
22	5.13	6.46	5.37	6.26	5.53	5.57	6.8	5.24	The Moon will be at Perigee on 13th, Apogee on 27th.
23	5.14	6.45	5.38	6.25	5.53	5.56	6.9	5.23	
24	5.15	6.45	5.38	6.24	5.54	5.55	6.9	5.23	4 April ☾ Last Quarter 11 33 p.m.
25	5.16	6.45	5.39	6.23	5.54	5.54	6.10	5.22	
26	5.16	6.44	5.39	6.22	5.55	5.52	6.10	5.21	11 „ ● New Moon 2 34 „
27	5.17	6.44	5.40	6.21	5.55	5.51	6.11	5.20	18 „ ☾ First Quarter 2 8 „
28	5.18	6.43	5.40	6.20	5.56	5.50	6.11	5.19	26 „ ○ Full Moon 6 5 „
29	5.19	6.43	...	...	5.57	5.49	6.12	5.18	The Moon will be at Perigee on 10th, Apogee on 23rd.
30	5.19	6.42	...	...	5.57	5.48	6.12	5.18	
31	5.20	6.42	...	...	5.58	5.47	...	...	

For places west of Brisbane, but nearly on the same parallel of latitude— $27\frac{1}{2}$ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane.

At Roma the times of sunrise and sunset may be roughly arrived at by adding 17 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

For the sunrise and sunset at Rockhampton, Townsville, Cairns, and other places in Queensland, readers may be referred to the "Queenslander" to which newspaper monthly astronomical notes will be supplied.—D.E.

QUEENSLAND AGRICULTURAL JOURNAL

VOL. IX.

MAY, 1918.

PART 5.

Agriculture.

MOLASSES AS A MANURE FOR CANE CROPS.

While on a recent visit to Mackay, the General Superintendent of Sugar Experiment Stations was afforded the opportunity of inspecting one of the most up-to-date cane farms in the district—that of Mr. W. Jackson, of North Eton. For many years past Mr. Jackson has been an ardent enthusiast in the use of sugar-mill refuse such as filter-press cake, wood ashes, and molasses, and the results obtained by him amply justify their employment. Any farmer living close to a mill would be well advised in carting away mill refuse and applying it to the land, as the cost of cartage in such cases is not prohibitive. Molasses is applied by Mr. Jackson at the rate of nearly 3,000 gallons per acre direct to the young cane and also to the ratoons over the trash. The results obtained by him are certainly surprising, the cane being of a rich green colour and far more vigorous and healthy and higher than that which received no molasses. A 200-gallon iron tank on a dray is used for distributing, and the work is cheaply and quickly done. At the same time it is well to remember that failures have occurred in some instances where the direct application of molasses has been made, and it is generally preferred to treat the soil with this substance about six months before it is proposed to plant cane. Mr. Jackson's success is no doubt due to the high ratio of lime in his soil, and a good lime content can be maintained by applying several loads of filter-press refuse. Unfortunately for growers this article is now fast disappearing from our mills, due to new processes eliminating the filter-presses. Lime, however, should be supplied in cheaper forms than it is at present for agricultural purposes, and if this could be done a large demand for same would be made.

QUEENSLAND STATE PRODUCE AGENCY.

Realising that primary production is the mainstay of all new countries, that agriculture is not only a prime factor in development but is at the present time vital to national safety, the Government, determined to do everything possible for the man on the land, has decided to establish an Agency for the sale and distribution of his produce without the intervention of a third party.

For long the farmer has aimed at this and attained some degree of success with butter, cheese, and sugar, but has been unable to overcome the difficulties of establishing closer relations with the consumer for all his other produce, and the State Government will endeavour, on behalf of the producer and consumer alike, to eliminate the middleman's profits; and, in order that this may be brought about, an agency is now established, entitled "The State Produce Agency of Queensland," with State, interstate, and oversea activities, prepared in a few weeks' time (which will be duly advertised in the daily papers) to handle, in any quantity, consignments of cereals, grain, vegetables, potatoes, fruit, hay, chaff, poultry, eggs, bran and pollard, dairy produce, honey, &c., as agent for the producer or owner thereof.

Where an opening is presented, this agency will market in the other States of the Commonwealth and oversea.

The Act establishing it specifically limits commission charges to what is fair and reasonable, abolishing exorbitant profits.

This ensures to the farmer the full value of the produce of his farm.

You will be entitled to see when, where, and to whom your consignment went, and what it realised; and you will receive a prompt, clear, clean account of sales. Your produce will be handled by experts (not novices); consequently, your consignment will realise full value, and you stand no risk of being unable to collect its proceeds, payment being assured and guaranteed by the Government.

This Agency cannot make a profit for anyone but the consignor, so it is really your business—a farmer's co-operative effort in scientific distribution, State-organised. It is a necessary complement to your farm to which good selling is essential, equal in importance to good planting and good harvesting. It will market the produce for you independent of the system which enables outsiders to make more profit out of your farm than you do yourself.

It will secure for you the best returns possible, and also a true and open market for your produce—one not to be deflated or inflated at the will of interested manipulators and operators. No consignment on any account will be taken over and used by this Agency for the purpose of making a general profit. Its one aim and object is to serve, realise, and give satisfaction to each individual consignor.

You are invited to at once open up communication with this Agency. Every possible information on the above subjects will be afforded you, and your correspondence appreciated and promptly attended to, and the records of your transactions with the Agency at all times open to your inspection; and the inclusion of your name as a foundation consignor is sought and will be valued.

WM. E. HOWES, Manager.

THE TREATMENT OF DAMAGED GRAIN.

The serious plague of mice which occurred last season in New South Wales, Victoria, and South Australia resulted in considerable damage to the wheat stored at inland centres. Whilst a certain proportion of the wheat was devoured by the rodents, a considerable quantity was damaged or tainted. Some stored wheat was also damaged owing to rain and the attacks of weevils. The treatment of damaged grain was also dealt with by the Executive Committee as follows:—

The problem arose as to the best method for treating such damaged grain to prevent further deterioration, and, if possible, to purify it so that it could be utilised for food purposes. In July, 1917, the Executive Committee of the Commonwealth Advisory Council of Science and Industry had an interview with Mr. A. O. Barrett, who has had considerable experience with grain in bag stacks, and he outlined a scheme whereby wheat should be stored in special silos after mixing with quicklime. He claimed that this lime treatment has the following advantages:—

1. It dries ordinary f.a.q. wheat, thus rendering it less liable to attacks of weevils, and at the same time improving its milling qualities.
2. It destroys the smell of mouse-tainted or smutty wheat, and sterilises the outside of the grain.
3. It removes the smell of damp, musty wheat and arrests further deterioration by fungus pests.
4. It inhibits the growth of weevils in wheat already infested and prevents them from developing.

These statements were supported by the exhibition of samples of damaged wheat which had been purified in the manner indicated, on a laboratory scale.

The Executive Committee thereupon appointed Professor D. Orme Masson, F.R.S., Professor of Chemistry; Dr. W. Heber Green, Lecturer in Agricultural Chemistry; and Dr. W. J. Bull, Lecturer in Bacteriology in the University of Melbourne, together with Professor T. R. Lyle, F.R.S., to carry out tests of the effects of quicklime on damaged grain on a larger scale, and gratefully accepted Mr. Barrett's offer to allow experiments to be undertaken at the firm's maltings at Richmond. The report on these experiments forms the main part of Bulletin No. 5, recently issued by the Advisory Council of Science and Industry.

Various samples of wheat (including (1) good, (2) weevily, (3) tainted, (4) damp and damaged, and (5) mousey) were treated first by passing each lot through a small-sized Eureka wheat-cleaning machine. The cleaned wheat was then weighed and mixed with 1 per cent. of its weight of quicklime, and then stored for about fourteen days. The good wheat f.a.q. (Federation type) parted with a considerable amount of moisture, and the general effect was that the addition of quicklime to sound grain is in no way harmful, and may be expected to produce some slight improvement. All weevils in the adult stage and practically all grain attacked were removed upon screening the weevily wheat, but the weevils were not killed; it is only by adding lime at a high temperature under the conditions of Mr. Barrett's scheme that this is effected. The tainted wheat lost nearly 20 per cent. upon being screened, and the pronounced mousey and musty odour was considerably reduced, but before the work of the lime could be completed it would require to be applied fresh and hot and left in contact for some months. The damp wheat, although not so bad as the previous wheat, was yet incapable of being converted into a wholesome article, though the lime had materially reduced the smell and bacteria present. The mousey wheat was treated with freshly ignited lime, and the results proved very satisfactory, showing conclusively that the lime, to be effective, must be applied hot. The bacteriological and chemical examinations made of the lime-treated wheat clearly indicate that considerable improvement has been effected.

The bulletin, which gives full details of these experiments, may be obtained post-free from the Secretary of the Advisory Council, 314 Albert street, East Melbourne.

COST OF COTTON-GROWING PER ACRE IN TEXAS, U.S.A.

As the cost of producing cotton will no doubt be frequently inquired about during the next month or two, we ("Commerce and Finance") take occasion here to refer to some figures adduced by W. B. Yeary, Assistant Director of the Bureau of Markets of the State Department of Agriculture at Austin, Texas. In a long discussion of the subject, published in a Houston paper, he gives the following

statement of the per acre cost of cultivating 1,080 acres of land on the Taft Ranch in 1912, when the yield was 300 lb. of lint cotton per acre:—

	Per Acre. Dollars.
Labour for cultivation, picking, ginning, &c.	12.87
Feed for mules, in addition to that grown on the farm . .	4.15
Supplies and repairs	.68
Poison	.74
Fertiliser (on small portion as experiment)	.15
Depreciation on stock and equipment	1.90
Seed for planting	.20
Overhead expenses, taxes, supervision, &c.	1.50
Total	22.19

These figures represent the cost of producing 300 lb. of lint cotton and 600 lb. of seed (900 lb. of seed cotton). Assuming that the seed sold for 20 dollars per ton, or 6 dollars, the cost of producing 300 lb. of lint cotton would have been 16.19 dollars, or 5.40 cents per lb. As the cost of ginning and the interest on the value of the land is not included, it may perhaps be proper to add an allowance of 1 cent per lb. to cover these items, which would bring the total cost of producing lint cotton on the Taft Ranch in the year 1912 to 6.40 cents per lb. . . . It is true that a yield of 300 lb. per acre is exceptional.

In 1912 the average production was 200 lb. per acre, and the Taft Ranch figures (plus 1 cent per lb. for ginning, interest and incidentals) applied to the whole area would indicate an average cost of 10.09 cents per lb.

The average advance in the price of all commodities other than cotton since 1912 has been about 80 per cent. On this basis the present cost of producing cotton as expressed in terms of other commodities was about 18 cents per lb.

That this figure is somewhere near the equitable value of cotton under present conditions is the conclusion to which most economists are coming. It may prove to be considerably above its market value if spinners' takings and exports continue to decrease at the present rate.

THE ETTERSBURG STRAWBERRY.

During the late strawberry season, a specimen of a strawberry was brought to this office, the fruit of which was produced on a tall stem. This was called by the grower, a "tree" strawberry. In the April issue of "Garden and Field," Adelaide, S.A., an apparently similar strawberry is described as the "Ettersburg." The information was derived from the Victorian Department of Agriculture, and is as follows:—

This is the so-called "tree" strawberry that was freely advertised last season, and sold at 1s. per plant. It is certainly not a "tree" strawberry—that name is quite a misnomer, and the term "bush" strawberry would certainly have been a better one.

The foliage has grown very vigorously, the leaves are strong, and altogether it may be described as an exceedingly robust and vigorous grower. The "tree" habit which has been ascribed to the plant occurs in the form of strong, rather long and upright flowering stems, which throw the flowers far above the foliage, and taller than any other strawberry so far grown here. Both the main stalk and the individual stems are long, and the flowers are usually well developed.

The first crop of fruit was not generally good, the second being heavier. The berries of the earlier crop were the larger. But neither the early nor the late crop produced berries of large dessert size, although the plants were grown under favourable conditions. The second crop quantity was good, the berries were well coloured, firm, and very well flavoured. So that, judging from the first season's results, it would seem that the Ettersburg strawberry suited the requirements as a jam factory berry, being sweet, solid, and prolific. But it has not proved itself worthy of being placed on the list of strawberries grown for dessert or table. It would be well if the term "tree" were abandoned in favour of a more descriptive name.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The following revised list of breeders of purebred cattle is published for the purpose of informing those who desire to improve their stock where the best cattle can be obtained in the State. The Department of Agriculture and Stock takes no responsibility in relation to the entries in the list; but, when inquiries were first made, the condition was imposed that the entries were to be only of stock that had been duly registered, or that were eligible for registration in the different herd books. The entries received were, in some cases, somewhat too confusing for proper discrimination, it has, therefore, now been decided that only such cattle as have been registered will be included. The lists previously published in the *Queensland Agricultural Journal* have now been withdrawn for revision.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
F. C. G. Gratton ..	"Towleston," Kingsthorpe	2	14	Holstein Cattle Club Herd Book
T. Mullen	"Norwood," Chelmer	3	20	Queensland Jersey Herd Book
J. H. Paten	Yandina	6	21	Ayrshire Herd Book of Queensland
Queensland Agricultural College	Gatton	4	38	Ayrshire Herd Book of Queensland
		..	2	Ayrshire Herd Book of Scotland
		2	9	Holstein-Friesian Herd Book of Australia
		2	31	Jersey Herd Book of Queensland
J. W. Paten	Wanora, Ipswich ..	10	42	Ayrshire Herd Book of Queensland
M. W. Doyle	Moggill	4	12	Queensland Jersey Herd Book
G. A. Buss	Bundaberg	1	15	Herd Book of the Jersey Cattle Society of Queensland
W. Rudd	Christmas Creek, Beaudesert	2	10	Milking Shorthorn Herd Book of Queensland
M. F. and R. C. Ramsay	Talgai, Clifton ..	5	27	Herd Book of the Jersey Cattle Society of Queensland
George Newman ..	Wyreema	12	47	Holstein-Friesian Herd Book of Australia
R. Conochie	Brooklands, Tingoorra	9	21	Queensland Jersey Herd Book

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
W. J. Barnes	Cedar Grove ..	10	37	Queensland Jersey Herd Book
T. B. Murray-Prior ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
W. J. Affleck	Grasmere, N. Pine ..	6	31	Queensland Jersey Herd Book
A. J. McConnel	Dugandan, Boonah	19	36	Australian Hereford Herd Book
A. Pickels	Blackland's Stud Farm, Wondai	4	62	Illawarra Dairy Cattle Herd Book of Queensland
G. C. Clark	East Talgai, Ellinthorp	3	7	New Zealand Herd Book
H. D. B. Cox	Sydney (entered brother's name)	3	16	Commonwealth Standard Jersey Herd Book
J. T. Perrett and Son	Coolabunia	2	36	Illawarra Herd Book of Queensland
State Farm	Kairi	4	8	Ayrshire Herd Book of Queensland
		1	2	Holstein-Friesian Herd Book of Australia
		45	127	Australian Hereford Herd Book
E. M. Lumley Hill ..	Bellevue House, Bellevue	2	22	Illawarra Herd Book of Queensland
W. T. Savage	Ramsay	50	400	Australian Hereford Herd Book
Tindal and Son	Gunyan, Inglewood	3	28	Queensland Jersey Herd Book
J. N. Waugh and Son	Prairie Lawn, Nobby	9	55	Ayrshire Herd Book of Queensland
J. H. Fairfax	Marinya, Cambooya (2)	25	100	Queensland Shorthorn Herd Book
C. E. McDougall	Lyndhurst Stud, Warwick (2)	6	20	Ayrshire Herd Book of Queensland
J. Holmes	"Longlands," Pittsworth	1	20	Illawarra Dairy Cattle Association
P. Biddles	Home Park, Netherby	1	9	Milking Shorthorn Herd Book
A. Rodgers	Torran's Vale, Lane-field	1	..	Holstein-Friesian Herd Book of Queensland
R. S. Alexander	Glenlomond Farm, Coolumboola	2	..	Holstein-Friesian Herd Book of Australia
		3	83	Ayrshire Herd Book of Queensland
State Farm	Warren	2	15	Holstein Cattle Club Herd Book
S. H. Hosking	Toogooloowah ..	2	11	Queensland Jersey Herd Book
W. J. H. Austin	Hadleigh Jersey Herd, Boonah	..	6	Commonwealth Standard Herd Book
Ditto	ditto	7	21	Ayrshire Herd Book of Queensland
H. M. Hart	Glen Heath Stud, Yalangur	3	9	Holstein-Friesian Herd Book of Queensland
C. Behrendorff	Inavale Stud Farm, Boonah	25	77	Ayrshire Herd Book of Queensland
F. A. Stimpson	Ayrshire Stud Farm, Fairfield, South Brisbane	5	21	Ayrshire Herd Book of Australia
M. L. Cochrane	Paringa Farm, near Cairns			

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
Albert Cook	"Greenmount," Mackay	1	8	A.-A. Stud Book, New Zealand
Thomas Brown	"Bellgrove," Kingaroy	1	14	Do.
Higgins Bros.	Sandy Creek, Leslie, Q.	6	2	Do.
Calcino Bros.	"Summariva," Charleville	3	4	Do.
W. M. McKelvie	"Undulla," Miles ..	5	4	Do.
James Connors	"Glen Erin," Nanango	1	2	Do.
J. A. Mackintosh	"Yundah," Warwick	2	8	Do.
M. J. Luff	Kaimkillenbun	1	1	Do.
A. Spencer	Brisbane	2	1	Do.
Beak Pastoral Co.	Rockhampton	2	10	Do.
W. Jackson	Central Farm, Savannah, Mackay	1	1	Do.
E. Swayne, M.L.A.	West Plane Creek ..	1	2	Holstein-Friesian Herd Book of Queensland
Godfrey Morgan	"Arubial," Condamine	3	6	Queensland Shorthorn Herd Book
John Anderson	"Fairview," Southbrook	7	34	Ayrshire Herd Book of Queensland
James Strong	"Woodlands," Gatton	6	23	Queensland Jersey Herd Book

TICK RESISTANT CATTLE.

BY DR. T. HARVEY JOHNSTON and MISS M. J. BANCROFT, B.Sc., Biology Department, University, Brisbane.

The subject of tick resistance of cattle has, in this State during the past few years, been associated with the name of Mr. Munro Hull, of Eumundi, on the North Coast Railway Line, and is at present being investigated by us.

The vital importance of the tick problem (as distinct from the subject of "tick fever" or "redwater") is brought home to every cattleman by the depreciation in value of an animal caused by "tick worry" and the trouble and expense incurred in the erection and maintenance of dips. The established fact that Mr. Munro Hull has had now for several years a large number of animals, which have become tick-resistant and have remained practically free from ticks, though running in ticky paddocks where control animals become heavily infested, and that these resistant cattle are never dipped or sprayed or treated in any way for ticks, alone warrants some attention being paid to the subject and to the possibilities of spreading the peculiarity.

In view of the fact that one or more tick-resistant animals occur in very many herds and the utter impossibility of examining more than a small fraction of the total number, all who are interested in the subject are invited to send to either of the abovenamed any observations they have made, or may make, which may help in the solution of the problem. It is felt that the experience and opinions of the many observant dairy farmers and cattle-raisers throughout the State would be extremely valuable.

Correspondents are particularly asked to note that the investigators are not at present concerned with the subject of "cattle-tick fever." It is hardly necessary to state that only facts are desired, uncertain statements being devoid of scientific value.

Authentic observations under the following headings as regards tick-resistant animals would be useful:—

1. Are these animals more usually of any particular breed?
2. The length and texture of the hair.
3. The colour, texture, and oiliness of the skin.
4. The general condition and stamina of the beasts.
5. The length of time the animals have been resistant. Have they possessed the resistance from birth, or have they acquired the peculiarity later in life?
6. The transmission of this resistance to progeny.
7. The nature of the country on which the animals are running.
8. Influence (if any) of food.
9. The effect (if any) of dipping upon such resistant animals.
10. Whether the exudate described below has ever been noticed on these cattle.

EXUDATE FOUND ON CERTAIN TICK-RESISTANT COWS.

This exudate or so-called serum has on many occasions been referred to by Mr. Munro Hull, who was, as far as we know, the first to bring it under public notice in Australia.

It consists of drops of a clear yellow fluid which appear on the skin on various parts of the body, notably on the escutcheon, where it is more evident owing to the shortness of the hair. These drops become thick and sticky, ultimately forming little granular masses or thin flat yellow scabs, according to the size of the original drop. These are readily flaked off, leaving a patch of clean, smooth skin below. Blood is sometimes present, in which case the resultant scab is discoloured. There is no evidence that each patch of exudate is caused by the bite of the tick. Very occasionally larval ticks have been found attached to a dry scab, owing, no doubt, to their having become entangled in the sticky fluid. The affected area is irritable, the cows showing a great desire to lick or rub the part. The condition is apparently more or less dependent on the weather, being more usually seen on a hot, muggy day.

There are certain conditions which may be confused with this exudation, *e.g.*, "tick sores." The only kind of tick sore which is likely to be mistaken for it is that in which the scab appears as a dark blood-stained centre to which a tick is often seen attached, surrounded by a ring of clear, yellow material. Beneath the discoloured centre is a little plug of blood and pus, while, when the scab is removed, a corresponding pit is seen in the skin.

The presence of a depression (often pus-filled) beneath the scab distinguishes a tick sore from the scab formed from the "serous" exudate. The presence of a tick or a depression where the mouth parts of a tick have been inserted is also a marked difference.

Thick whitish scurfy scabs occur especially at the butt of the tail and in the ears of some animals, but no cattle-owner is likely to confuse these with any of the conditions abovementioned.

MEASURING LOG TIMBER.

There are five systems of measurement in use for the purpose of ascertaining the cubic and superficial content of log timber in various countries, known as the "Die Square," "Calliope Measure," "True Contents," "Board Measure," and "Quarter Girth." The latter system—"Quarter Girth"—is that in use in British countries, and is generally approved, as it distributes the waste between the vendor and the purchaser. The Rule is:—

Multiply the length of the log in feet by the square of the quarter of the girth in inches in the centre of the log, and divide by 144, which gives the cubic contents in feet, or multiply this by 12 and the superficial feet area is obtained at 1 inch thick.

TO OBTAIN THE APPROXIMATE YIELD OF 1-INCH BOARDING IN A LOG.

Divide the mean girth in inches by 5 for the number of equivalent boards (*b*); multiply the result by the length (*l*) multiplied into the diameter (in feet to the nearest decimal) (*d*) for the yield in superficial feet (*f*). An example may be given thus—

Mean girth of log, 80 inches; length of log, 30 feet.

Then, $b \times l \times d = f = \frac{80}{5} \times 30 \times 2.1 = 1,008$ feet.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RETURNS OF COWS FROM 26TH FEBRUARY TO 29TH MARCH, 1918.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%.	Lb.	
Lady Margaret ...	Ayrshire ...	28 Dec., 1917	742	4.5	39.52	
Mistress Bee ...	Jersey ...	23 Jan., 1918	681	4.6	36.90	
Lady Spec... ..	Ayrshire ...	19 Feb. „	884	3.4	34.88	
Sweet Meadows ...	Jersey ...	8 Aug., 1917	444	6.6	34.75	
Miss Edith... ..	„ ...	23 Dec. „	658	4.1	31.68	
Burlesque	„ ...	27 Mar. „	381	7.0	31.65	
Leading Lady ...	„ ...	26 Dec. „	579	4.6	31.37	
Belinda	Ayrshire ...	14 Jan., 1918	767	3.5	31.37	
Miss Bell	Jersey ...	27 June, 1917	489	5.4	31.19	
Miss Edition ...	„ ...	12 Nov. „	588	4.4	30.45	
Jeannie	Ayrshire ...	13 Dec. „	716	3.6	30.18	
Hedge's Nattie ...	Holstein ...	1 Feb., 1918	730	3.5	29.84	
Netherton Belle ...	Ayrshire ...	17 July, 1917	487	5.0	28.73	
Violette's Peer's Girl	Jersey ...	27 June „	470	5.0	27.73	
College Ma Petite ...	„ ...	19 Nov. „	470	5.0	27.73	
College Cold Iron ...	„ ...	7 Dec. „	478	4.8	27.05	
Lady Dorset	Ayrshire ...	14 Aug. „	516	4.2	25.47	
Thornton Fairetta ...	Jersey ...	30 June „	315	6.8	25.41	
Hedge's Dutchmaid ...	Holstein ...	7 Sept. „	597	3.6	25.19	
Comedienne	Jersey ...	13 Dec. „	426	5.0	25.13	
College Mermaid ...	„ ...	21 Aug. „	424	5.0	25.01	
Miss Betty	„ ...	27 Mar. „	319	6.6	24.81	
Songstress	Ayrshire ...	1 Oct. „	448	4.4	24.20	
Hedge's Madge	Holstein ...	22 Mar. „	442	4.6	23.94	
College Damsel	„ ...	12 July „	674	4.2	23.41	
Lilia	Ayrshire ...	11 July „	471	4.2	23.23	
Iron Plate	Jersey ...	28 June „	671	4.2	23.11	
Lady Annette	Ayrshire ...	19 Oct. „	425	4.6	23.03	
College St. Margaret	Jersey ...	9 Nov. „	461	4.2	22.74	
Prim	Holstein ...	3 Aug. „	552	3.4	21.92	
Skylark	Ayrshire ...	24 May „	409	5.2	21.18	
La Hurette Hope ...	Jersey ...	22 Aug. „	377	4.7	20.87	
College Bluebell ...	„ ...	28 June „	391	4.3	20.65	
Netherhall Queen	Ayrshire ...	30 June „	476	3.7	20.63	
Kate						
Charity	Jersey ...	26 June „	267	6.4	20.24	

INBREEDING OF DAIRY CATTLE.

It cannot be too prominently kept before dairymen that the only available way to increase the production from their cows is to grade up from what they possess with a purebred dairy bull from a herd with no doubtful blood in it, and it is a well-known fact that we have many such herds in this State. We have dairy bulls to choose from that have Australian records behind them for fifty years, and British another fifty years behind that, and whose offspring at two years old have been going begging for some years before the war for buyers at £10 to £12 per head, finding only few purchasers. And a two-year-old bull will last a farmer ten years, because the surest way of improvement is to use the same bull on his own progeny for as long as he lives. Out-breeding has been the curse of cattle-breeding for the dairy in some States all along. Mr. McNab, Tasmania, in 1900, mentioned a small dairy herd of twelve cows bred up from Shorthorn dams with an Ayrshire bull, a really grand lot, which were being put to an Alderney at the time of his visit; and had the owner started with an Alderney he would probably have had as good a lot; but the case shows the manner in which stock gets mongrelled up by out-breeding. The two herds specially noted by Mr. McNab as being desirably graded up were already in a fair way to being obliterated, as far as uniformity of type goes.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, MARCH, 1918.

The fourteenth egg-laying competition held at the College was brought to a close on 31st March. In order to complete the full year (the competition commenced on 3rd April, 1917), the birds owned by Messrs. E. Chester and R. Burns were kept in the pens until the evening of 2nd April, with the result that the former pen increased its score by 9 eggs, making a grand total for the 365 days of 1,661. Mr. Burns's bird laid one more egg, making her total for the full year 335. A full report on the whole competition will be issued later. The following are the individual records:—

Competitors.	Breed.	March.	Total.
LIGHT BREEDS.			
E. Chester	White Leghorns ...	138	1,652
G. Chester	Do.	78	1,366
W. Becker... ..	Do.	107	1,366
*G. H. Turner	Do.	99	1,366
*J. M. Manson	Do.	104	1,348
W. R. Crust	Do.	79	1,343
Oaklands Poultry Farm	Do.	73	1,343
T. Taylor	Do.	108	1,316
F. W. Leney	Do.	67	1,304
D. Fulton	Do.	103	1,301
Kelvin Poultry Farm	Do.	78	1,295
*J. R. Wilson	Do.	112	1,277
*A. T. Coomber	Do.	79	1,258
Chris. Porter	Do.	102	1,251
T. A. Pettigrove, Victoria	Do.	84	1,246
*J. Zahl	Do.	88	1,231
Moritz Bros., S.A.	Do.	75	1,207
J. G. Richter	Do.	58	1,186
T. B. Hawkins	Do.	77	1,180
*Dixie Egg Plant	Do.	107	1,178
C. Knoblauch	Do.	91	1,178
Mrs. S. J. Sear	Do.	96	1,164
*Mrs. J. R. D. Munro	Do.	63	1,164
Quinn's Post Poultry Farm	Do.	53	1,164
Mrs. W. D. Bradburne, N.S.W.	Do.	69	1,157
C. H. Singer	Do.	106	1,156
J. L. Newton	Do.	66	1,154
A. Shillig	Do.	66	1,142
J. Holmes	Do.	67	1,132
L. G. Innes	Do.	87	1,130
A. H. Padman, S.A.	Do.	54	1,124
*A. W. Bailey	Do.	75	1,121
Mars Poultry Farm	Do.	49	1,093
C. P. Buchanan	Do.	62	1,081
S. C. Chapman	Brown Leghorns... ..	59	1,079
F. Clayton, N.S.W.	White Leghorns... ..	57	1,079
E. Cross	Do.	48	1,076
*T. Fanning	Do.	75	1,074
G. J. White	Do.	37	1,074
E. A. Smith	Do.	73	1,069
Miss M. Hinze	Do.	75	1,062
J. Ferguson	Do.	74	1,059

EGG-LAYING COMPETITION—continued.

Competitors.	Breed.	March.	Total.
LIGHT BREEDS—continued.			
R. Holmes	White Leghorns ...	77	1,054
G. Howard	Do.	78	1,046
Mrs. J. Carruthers	Do.	79	1,034
Geo. Williams	Do.	46	1,028
*A. E. Walters	Do.	48	1,004
*Dr. E. C. Jennings	Do.	62	997
*C. C. Dennis	Do.	0	822
HEAVY BREEDS.			
*R. Burns	Black Orpingtons ...	120	1,470
*Mars Poultry Farm	Do.	120	1,428
W. Smith	Do.	99	1,303
A. E. Walters	Do.	90	1,277
*E. F. Dennis	Do.	74	1,217
W. P. Hanson, N.S.W.	Do.	65	1,183
P. C. McDonnell, N.S.W.	Do.	58	1,173
*E. A. Smith	Do.	95	1,168
F. A. Claussen	Rhode Island Reds ...	61	1,161
D. Kenway, N.S.W.	Black Orpingtons ...	98	1,138
Mrs. J. H. Jobling, N.S.W.	Do.	39	1,130
H. Jobling, N.S.W.	Do.	70	1,104
C. B. Bertelsmeier, S.A.	Do.	94	1,082
Cowan Bros., N.S.W.	Do.	79	1,073
King and Watson, N.S.W.	Do.	81	1,063
J. M. Manson	Do.	90	1,021
*Oaklands Poultry Farm	Do.	42	1,001
R. Burns	S. L. Wyandottes ...	63	1,001
*Miss M. Hinze	Black Orpingtons ...	30	987
E. Morris	Do.	86	976
C. C. Dennis	White Wyandottes ...	88	975
*Kelvin Poultry Farm	Plymouth Rocks ...	48	934
*F. W. Leney	Rhode Island Reds ...	30	778
F. Clayton, N.S.W.	Do.	42	769
Totals	...	5,488	83,968

* Indicates that the birds are engaged in single hen test.

DETAILS OF SINGLE HEN PENS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
G. H. Turner	178	210	248	262	221	247	1,366
J. M. Manson	229	243	186	178	240	272	1,348
J. R. Wilson	229	203	193	219	209	224	1,277
A. T. Coomber	206	160	250	237	205	200	1,258
J. Zahl	243	110	247	149	247	235	1,231
Dixie Egg Plant	195	217	178	239	127	222	1,178
Mrs. J. R. D. Munro	264	197	144	153	162	244	1,164
A. W. Bailey	36	213	229	227	227	189	1,121
T. Fanning	157	209	187	146	157	218	1,074
A. E. Walters	120	130	182	222	176	174	1,004
Dr. Jennings	129	118	207	189	220	134	997
C. C. Dennis	176	89	77	154	162	164	822

EGG-LAYING COMPETITION—*continued.*
DETAILS OF SINGLE HEN PENS—*continued.*

Competitors.	A.	B.	C.	D.	E.	F.	Total.
HEAVY BREEDS.							
R. Burns	204	195	267	193	277	334	1,470
Mars Poultry Farm	220	255	232	234	249	238	1,428
E. F. Dennis	233	231	201	277	239	36	1,217
E. A. Smith	193	201	171	218	196	187	1,166
Oaklands Poultry Farm... ..	220	136	144	124	233	144	1,001
Miss M. Hinze	161	136	130	181	185	194	987
Kelvin Poultry Farm	137	143	160	211	106	177	934
F. W. Leney	133	165	118	115	114	133	778

NON-PRODUCTIVE HENS.

Mr. R. T. G. Carey, of Pindora Poultry Farm, Beerwah, whose article on trap-nests for poultry appeared in the March issue of this Journal, sends us a further instructive paper on unproductive hens, which will probably be of interest to those of our readers who are entering on the poultry industry. Mr. Carey writes:—

“One of the essential points in poultry farming not to be overlooked, is that relating to the hen which does not lay eggs. The expense incurred for the keep of such hens, and the room that they occupy upon the perch, afford no corresponding remuneration. Hence, should there be ten such ladies in a flock, each eats from 3½ to 4 oz. of feed daily, and in a week those hens would devour 17 lb. 2 oz. of food, and a month's supply would amount to 68 lb. 8 oz. of feed. That cost incurred, with present-day prices, shows how expensive it is to stock such hens. With bran and pollard at 1s. 8d. per bushel, wheat 5s. 3d. per bushel, and maize 5s. per bushel, which is approximately their respective value at the time of writing, the 68 lb. 8 oz. of feed would cost 7s. 6d. per month, or £4 4s. for a year's maintenance. What a foolish idea it is, then, to keep such unprofitable hens, thus courting failure quickly. But that is not all. We have not estimated the daily visits to the yards for eggs that were not there, the labour of carrying water for drink, the cleaning up of manure and other refuse, which make them a source of tremendous expenditure and swamps up all the profits of the productive fowls. The elimination of non-productive hens helps to minimise the expense, and prompt culling reduces the grain bill from 20 to 25 per cent., without affecting the egg yield, thus revealing that the non-laying hen is absolutely worthless and that to sell her at market value is the best course. One naturally asks: How can you tell a non-productive hen among a flock of fowls when all look alike? The daily visits and your careful observance of each individual bird becomes part of your instinct, enabling you to note at a glance many points, such as faulty shape of the face, crow-face, ugly or unnatural comb and wattles, wrong-coloured eyes, under-projection of beak, wry tail, hunch back, bow legs, five toes where there should be only four, or *vice versa*, and a host of other defects, which denote points for culling and the lessons to study.

“The visible signs which indicate the non-productive hen are easily recognised. Upon every fowl of the lighter breeds, the pigmentation upon the legs, beak, vent, and hide shows up strongly at an early age, but when the laying season is fully on, all that colouration disappears and a bluish hue appears; the bird's feathers are ragged and tail and wing feathers become bare, resembling points of wire, while she is lean and extremely active. This is the layer. Should a number of fowls appear to have bright-yellow colouration upon their legs, beak, and earlobes when the laying

season is at its height, and their feathers neat and clean, body plump, very particular about her food, that is her ladyship, the non-productive hen, and that is the ocular test as you walk through the flock.

“The scientific test is made by placing three or four fingers between the pin bones near the vent; should there not be sufficient space to admit of the three fingers, then the passage is too small, hence the small egg; but should there be great depth with good width at the business end of a hen, and the feathers fluffy, while the abdomen is pliable, that is the large egg-layer. Again, the length of back is also a good sign of a productive layer. Show birds are picked upon points of attractiveness, their laying abilities not being studied.

“Professor Kirkpatrick, of the Connecticut Agricultural College Poultry Department, U.S.A., reports on the results of culling of flocks: ‘Every flock, small or large, should be rigidly examined and deeply culled, so as to gain profits from all the productive fowls and save the waste entailed by the upkeep of the non-productive hen.’ That statement and the action of deeply culling form the base of all profitable poultry farming. If the latter be performed, then there would be no lack of egg production, and the financial success of every individual owner of flocks of hens and pullets would be assured.

“Surely, with the laying capabilities of our Australian hens, and the ideal climatic conditions, in an ideal country, to enlarge the capacity of our poultry plants, and with such a ready market at hand, to get rid of unpromising poultry, nothing but the very best of stock should remain. But that is not all. Amongst all the latest inventions for incubation the newest, a ‘Cabinette Mammoth,’ of 2,400-egg capacity, occupying a space of only 5 square feet, with electric fan chambers, no cooling, and a host of other labour-saving devices, indicates how easily the broods can be hatched out. Then the giant colony brooders for 500 to 1,000 chicks to foster-mother them has relieved mankind of a huge amount of worry, time, and labour, and hurries on the breeding with amazingly light work, so that the whole of the old slow-hatching methods of our foreparents has been completely modernised to a branch of science, and the whole outcome of chicken-raising has been brought down to a limitation of months, and even to days, instead of years. Hence the study and careful examination of the embryo of the fertile and unfertile eggs, deformity, weaklings, and other defects well known to breeders has taught them to begin at the early stage to sort out the undesirable; and as age creeps on over the great hatches, and maturity approaches, the sickle of culling must be carried into effect. Then, what is the result? A perfect-looking flock and one of promise; and one says: ‘Ah, well done; I’m right now; all’s well.’ But no; we have not finished yet. Now comes the laying period, and here is another problem confronting us. That pullet ought to lay but does not. Those pullets of fine carriage, splendid plumage, delicate and ladylike are the particular ones for observation, and require an excursion trip to some profitable market, and so ends her career—space, feed, labour, all saved, and still room left for the worker.

“The United States Government estimates that, since the war, the herds of Europe have been reduced by 115,000,000 meat animals—i.e., 28,000,000 cattle, 54,000,000 sheep, and 32,000,000 hogs—the reduction still being advanced each day. Therefore, with such a huge decrease of meat-producing stock, what a great opportunity awaits poultry-breeders to hatch in big quantities. Poultry is the shortest, quickest, and most profitable source of increase in a limited period of half-yearly instalments of a nutritious food. It therefore behoves Australian poultry-breeders to raise the quantity (for the demand is sure to flow in our direction) to meet that great meat shortage. This is where the great culling gains, and reward for the produce becomes remunerative, the non-productive hens add to the cockerels’ quota, and farmers have got the egg-supplying and prolific breeding stock left for good purposes. When the war terminates, those stricken areas must have stud stock to rebuild up their poultry-yards, and Australian breeders should be prepared to meet the demand, as the expansion of the poultry industry is looming ahead, and it is the productive fowls that will build up this noble enterprise and not the non-productive hen.”

Viticulture.

HINTS TO GRAPEGROWERS.

By C. A. GATTINO.

MANURING.

Although the virgin soils of this country do not need any, or at least very little, manuring for several years after being planted, there comes a time when it is required, so that the vine will give a plentiful crop.

The yearly production of grapes and new wood take away each year considerable quantities of matters which form the fertility of the soil. Therefore, to continue and improve such production, we must give back to the soil, under artificial form, the fertile substances given by nature. The substances which generally need replacing are potash (phosphoric acid), nitrogen, and organic matter.

A good, cheap manure may be obtained by digging in all leaves, grapes residues, green-fodder crops, &c.; the town's sweepings and a little stable-yard manure are also good fertilisers for vines. Generally the manures are applied by turning in with the plough or the hoe as soon as they are spread. For soils poor of lime it is a good practice to spread lime at intervals of about ten years.

Hereunder are some practical rules for the manuring of the vines:—

1. For calcareous soils: Ashes, decomposed branches and leaves of the same vines, and maize stocks well chopped.
2. For pebbly soils: Turning under green lupine or trefoil, the spreading of lime, ashes, and fresh surface soil from the woods containing plenty of humus.
3. For clayey soils: First place small stones at the bottom of the holes where the vine is to be planted, and then sand, charcoal, dry vine branches, &c.; put in the soil residues of grapevine branches; also lime or ashes not containing any lye.

With this system you will loosen the soil, improve the natural drainage, and enrich it with materials required by the vine.

(TO BE CONTINUED.)

PRACTICAL HINTS IN ESTABLISHING A VINEYARD.

BY P. MAHONEY.

The most practical method under which to establish a vineyard for commercial purposes, on a small or large, extensive scale, is: First and foremost to plough the land thoroughly to the depth of about 9 in. in February or March (whether virgin land or otherwise). Then harrow it level, but not fine, so as to give the light and air full access in and around the soil, to perform the duties of sweetening and liberating plant-food. Then get the square of the block, more particularly if the vines are not going to be trellised, so as to facilitate cross-cultivation. For without squaring the piece to be planted, the rows will not run straight or parallel both ways, thus debarring cross-cultivation, which is most essential for numerous reasons, viz.:—For the saving of hoe work in keeping down weeds, &c., and conserving of moisture, which is most important, and preventing the ground from becoming baked and hard between the plants during dry spells. Then after the square has been secured and pegs put in on the top and bottom of the land to the distance at which the vines are to be planted, get two steady, strong horses and a plough. Then plough four furrows 9 or 10 in. deep, two one way and two in the opposite direction, leaving no land uncut. These four furrows are to be cut in a straight line between a peg on the top and one on the bottom of the land, leaving the open furrow in a direct line between the pegs. After the whole block has been treated in this fashion—that is, only ploughed between the pegs—the subsoiler is to be brought into action. An ordinary plough, with the mould-board removed, makes a good subsoiler. Set it at as great a depth as the horses can pull it. Three horses are rightly needed on it, but two will do good work. Run it in the bottom of the open furrows (centres) in each score. Now, this being done, the land is left in that state until it rains. If a heavy rain occurs before the time comes for the filling in of the furrows, it would be advisable to run up the furrows once more with the subsoiler, since if the rain should have been heavy it would have a tendency to run the soil together again, but otherwise it is not required. To get the best results, this should be completed not later than March. Now, when these conditions have been complied with, it is necessary to let the furrows lie open until rain occurs. Then, immediately after the rain, run through each furrow with a Planet Junior cultivator (one horse), having it set just a little wider than the open furrow, so as to assist aerating and sweetening. In the case of no rain occurring for about six weeks, the cultivator should be run through the furrows in their dry state. This should be continued until about the end of June or July, when it is deemed satisfactory that the last serviceable rain has fallen before planting season has arrived. After the abovementioned rain the land will have to be ploughed back into the centre, first starting by ploughing two furrows on each row, throwing them towards each other. Do this to the whole block. This will leave two open furrows in each row, of which the subsoiler is to be run in them the same as the first one. Then two more furrows are to be thrown up as with the previous two, and also subsoiled. This having been done, the ground will be left in a mound, which can be levelled with a harrow or disc cultivator, and should be kept in good buckle for planting through the assistance of cultivator and harrows. Now the pegs on the top and bottom sides should be replaced, as probably they were disturbed. Then a line can be drawn from peg to peg with pieces of tape or cloth indicating where vines are to be planted. Later on, during the growing season, more subsoiling can be done—that is, if the growth of the vine warrants it; if not, it can be left until the following season. It is not advisable to subsoil all the land, for in a country such as this, where the rainfall is great, it would have a tendency to run together before the roots derived any advantage from the subsoiling. Undoubtedly subsoiling pays a hundredfold, for it encourages the plant to root deep and also spread without any check. Subsoiling in this way is more satisfactory than trenching or explosives, for it can be done as the plant is growing, thus encouraging the roots, without any fight in the plant's infancy, to spread and go deep, which means everything during dry spells, &c.

(TO BE CONTINUED.)

Botany.

ILLUSTRATED NOTES ON THE WEEDS OF QUEENSLAND.

By C. T. WHITE, Government Botanist.

No. 13.

MOSSMAN RIVER GRASS (*CENCHRUS ECHINATUS*, LINN.)

Description.—An erect annual grass, 1-3 feet high, the lower parts of the stem occasionally prostrate and rooting at the nodes. Leaves rather long, flat, glabrous or scabrous-pubescent. Spikes dense, cylindrical, 1-4 inches long; the “burrs” are 3-4 lines in diameter and consist of an involucre of hardened spines connate below and forming a bristly cup at the base, and contain several (usually 2-4) spikelets.

Distribution.—Found in most tropical countries, said to be a native of tropical America; elsewhere probably naturalised. In Queensland it is represented in the Government Herbarium from the following localities:—Johnstone River (*Dr. T. L. Bancroft* and *Rev. N. Michael*), Nelson (*A. A. Girault*), Townsville (*W. Weston*), and Atherton Tableland (*C. T. White*).

I have also received specimens for identification from Fiji (hab., Lautoka, *W. Greenwood*) and New Guinea (hab., Duke of York Islands, *W. Bradtke*).

The reason that it has been passed over previously is that it has been confused with the two other Queensland species (*Cenchrus australis* and *C. clymoides*). It is probably naturalised in Queensland though it has been here for over thirty years.

We also have in our herbarium Papuan specimens collected at Boku by Mrs. H. P. Schlenker. These were recorded as Papuan, as *Pennisetum cenchroides* by F. M. Bailey (*Queensland Agricultural Journal*, Vol. 23, p. 220).

Ewart and Davies record the allied species *Cenchrus tribuloides*, as a naturalised alien in the Northern Territory.



PLATE 14.—MOSSMAN RIVER GRASS (*Cenchrus echinatus*, Linn.).

Entomology.

EXPERIMENTS IN TRAPPING THE QUEENSLAND FRUIT-FLY (*BACTROCERA TRYONI*).

In order to definitely prove the value of certain fruit-fly lures which have recently been discovered by private persons, numerous experiments have been conducted by this Department during the past two years. These experiments have shown that the male fly can be attracted in large numbers by a lure which is apparently a sex lure, and that both male and female flies can be attracted by means of a food lure discovered by Mr. A. W. Harvey, a nurseryman of Clayfield.

In order to demonstrate the value of the latter lure thoroughly, Mr. James Mitchell, of this Department, was instructed to carry out a practical trial on the 25th of March, under strict test conditions.

Mr. Mitchell has submitted the following report:—

“I have to state that in compliance with your instructions I proceeded to Mr. A. W. Harvey’s nursery, at Clayfield, yesterday, the 25th instant. I obtained a trap from Mr. Harvey, baited with his lure, and placed the trap under a *Solanum* at 9 a.m.

“The trap was left in this place for an hour and a-half, when I removed it to the property of Mrs. Hutton, at Albion, where I placed it under another *Solanum* at 11 a.m. and kept it there till 5 p.m.

“I remained with the trap throughout the day, and do hereby guarantee that all the flies submitted herewith were attracted by the lure on the trap, and were caught and held by the trap. The weather conditions were not too favourable for the test, as the wind was gusty, and during the period of fully an hour no flies were caught on account of the smoke from a grass fire in the neighbourhood, which enveloped the trap. The greater number of flies were caught during the earlier part of the day, and after 3 p.m. During the middle of the day few flies were caught.”

This report was submitted to Mr. Henry Tryon, the Government Entomologist, who reported as follows:—

“I am in receipt of a parcel of fruit-flies referred to by Mr. Inspector James Mitchell in his communication of even date (26th March, 1918) as having been captured by him in the course of an experiment carried out yesterday, in which a trap and lure furnished by Mr. A. W. Harvey were used.

“I have now to add that it is found, on examination of the said parcel of fruit-flies, that it comprises 231 examples of *Bactrocera Tryoni*, the common fruit-fly of Queensland, and that of this number 138 are male individuals and 93 females.

“Of these female flies, eight were dissected by my assistant, in order to ascertain the condition of their ovaries; with the result that two were found to be filled with ova—one containing thirty nearly mature eggs, and the other many immature ones.”

The result of the trial is therefore considered satisfactory, as it has definitely proved that both male and female Queensland fruit-flies can be attracted by the lure and caught by a specially constructed trap which has been invented and patented by Mr. A. W. Harvey.

A very interesting point is revealed by the latter portion of Mr. Tryon's report, which shows that the flies were evidently caught before they had done any damage.

This is a very important point, as each female fly is capable of laying as many as 200 eggs and, consequently, of destroying a large number of individual fruits.

THE NORIT PROCESS OF MANUFACTURING WHITE SUGAR.

The “International Sugar Journal” published, in 1915, a lecture by Dr. A. Wijnberg on “The Norit Process of Manufacturing White Sugar.” In this process it is claimed that the colouring matter of the juice is removed by means of so-called “decolourising carbon” (manufactured under the name of Norit), in the same manner that this is effected by animal charcoal in the sugar refinery. This substance has already been successfully employed for bleaching purposes in various industries, but hitherto has not been used in sugar-works, partly on account of its cost and partly because a method of regenerating was not known. It was now found that the decolourising colour of Norit can be largely restored by boiling for fifteen minutes with a 3 per cent. solution of caustic soda.

Norit is stated to exert its decolourising action on slightly acid sugar solutions, the colour being only slightly or not at all removed when the solution is alkaline. The author explains this action by reference to the properties of colloids of the nature of pectin which are transformed into larger molecular groupings in feebly acid solutions, but into smaller ones in alkaline. The large molecular groups are held by the decolourising carbon, while the smaller ones are not.

It is claimed that the decolourising power of Norit is about seventy-five times greater than granular animal charcoal. Its decolourising power is relatively greater in dilute sugar solutions as compared with concentrated ones; hence it is recommended to use Norit to bleach the juice rather than syrup. Norit is stated to possess the advantage of removing pectins and gums from sugar solutions, so that juice decolourised by this means is more easily filtered.

A continuation of the article was promised in which the practical results obtained in certain factories and refineries would be considered. These results have not reached us. (Ed. *Q.A.J.*)

Animal Pathology.

PROTECTION FROM WEEVILS.

The problems affecting wheat storage or, as it might be more accurately described, wheat preservation are of extreme urgency in view of the prospect of a serious shortage in the food supply of the world as one of the results of the war, and it is obviously a matter of exceptional importance to prevent, as far as possible, the destruction and loss of grain in store through the ravages of pests.

Recognising this, the British Government asked the Royal Society of London to arrange an investigation into the damage done by insects to grain in store throughout the Empire.

The Executive Committee of the Commonwealth Advisory Council of Science and Industry received, through the Prime Minister's Department, in October, 1916, a request from the Royal Society that a committee should be appointed in Australia to co-operate with similar committees in England and Canada in this investigation. Reports were obtained from the Government Entomologists of each State, and it was shown that considerable losses were caused annually in Australia from grain weevils and other pests. The Executive Committee thereupon appointed a special committee to make further investigations.

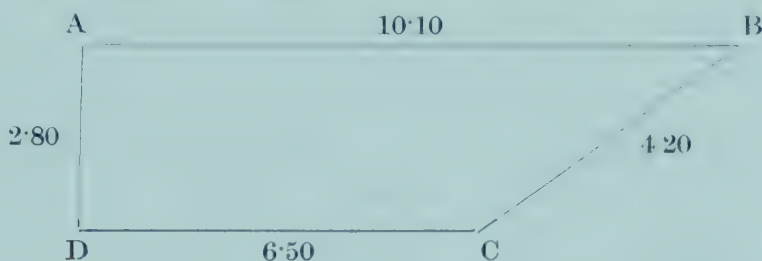
This special committee included Mr. Leo Russell, representing the Milling Industry; Professor W. A. Haswell, F.R.S., Professor of Zoology in the University of Sydney; and Mr. W. W. Froggatt, Government Entomologist, New South Wales. Mr. F. B. Guthrie, Chemist to the Department of Agriculture of New South Wales subsequently joined the committee. The progress report prepared by this special committee has now been published in Bulletin No. 5 of the Advisory Council, and can be obtained post free from the Secretary, 314 Albert street, East Melbourne. The report indicates that only the two grain weevils (*Calandra granaria* and *C. oryzae*) demand special measures on account of their destructive effects on stored grain, that the development of weevils in wheat and their increase in number may be checked by not using old bags which may be weevil-infested or storing in buildings likewise infested, and that bags of weevil-infested wheat should not be brought into contact or near that which is sound, for before wheat can become infested there must be a female to lay her eggs in the grains of wheat. It is only when the perfect insect, after going through the various stages of its larval existence, emerges through a tiny hole in the grain that the damage is evident, and except during the pupating state destruction is going on during the whole life of the insect. Under suitable conditions it takes from nineteen to twenty-two days from the egg to the adult beetle, and in three months in one experiment 40 weevils produced 3,056 descendants. Under the present system of handling wheat the destruction of weevil, once it has gained access to the bagged grain, seems hopeless; many methods of fumigating grain have been tried, and so far the most effective is that of poisoning with the fumes of carbon dioxide, but with bagged wheat this is not applicable save at a prohibitive cost. Sun-dried wheat contains only 4.7 per cent. of moisture. Neither in this nor in wheat as it emerges from the thresher with a moisture content up to 6.7 per cent. will weevil breed. With 8 per cent. of moisture they died in six weeks without breeding, at 9 per cent. they remained dormant, but with anything above the latter, provided they had free air, they became active and bred. It would thus appear that dry wheat stored in airtight bins is immune from the attack of weevils. Wheat when first bagged does not, under ordinary circumstances, contain sufficient moisture to enable weevils to breed, therefore, unless moisture is added from without, the grain remains weevil-proof. Thus, if stored in a fairly dry climate, completely protected from the weather, it is certain that wheat may be stored for an indefinite period without any damage from weevil.

General Notes.

TO MEASURE LAND WITHOUT THE AID OF INSTRUMENTS.

In the case of a four-sided field, each of the sides being of unequal length, a surveyor would commence by running a line which would divide the field into two triangles, and would then calculate their area by a mathematical process, unintelligible to most working farmers. Any man, however, who can add and multiply, may reckon up the number of acres in any four-sided field without recourse to either surveyor, theodolite, or trigonometry.

Suppose a field, whose four sides are, respectively, 4.20 ($4\frac{1}{5}$), 6.50 ($6\frac{1}{2}$), 10.10 ($10\frac{1}{10}$), and 2.80 ($2\frac{4}{5}$) chains in length, as shown in the diagram:—



First, add the two opposite sides together, and divide by 2, thus:—

$$AB + CD = 10.10 + 6.50 = 16.60 \div 2 = 8.30$$

$$AD + BC = 2.80 + 4.20 = 7 \div 2 = 3.50$$

Now multiply these two results together—

$$8.30 \times 3.50 = 2.90500$$

Cut off five figures from the right. (Note that in ordinary decimal multiplication four figures would be cut off.)

You now have:—

$$2.90500 \text{ or } 2 \text{ acres and a fraction.}$$

To find the roods, multiply the decimals (not the 2) by 4, and cut off five figures.

(2.) $.90500 \times 4 = 3.62000$, or 3 roods and a fraction. To find the perches, multiply the decimal figures by 40, and cut off the five decimals.

(3.) $.62000 \times 40 = 24.80000$, or 24 perches and a fraction. If the square yards are required, multiply by 30.75, and cut off seven figures.

(24.) $.80000 \times 30.75 = 9.2250000$, or 9 square yards. And for the square feet, multiply the decimals by 9 and cut off seven figures.

(9.) $.2250000 \times 9 = 2.0250000$, or 2 square feet. Thus the field is found to contain—

$$2 \text{ acres } 3 \text{ roods } 24 \text{ perches } 9 \text{ square yards } 2 \text{ square feet.}$$

SOCIETIES, SHOW DATES, Etc.

Gladstone—Port Curtis Agricultural, Pastoral, and Mining Association: Show dates: 11th and 12th June.

Minehan's Siding, *via* Townsville—Haughton River Farmer's Association, R. Walton, Secretary.

Childers—Isis Primary Producers' and Canegrowers' Association, John R. Wrench, Secretary.

Hughenden—North-Western Queensland Pastoral and Agricultural Association. Show dates: 20th and 21st May.

EXPERIMENTS TO DETERMINE THE KEEPING QUALITIES OF ENSILAGE.

The Director of Agriculture states that any process in normal seasons which will satisfactorily conserve fodder in a succulent form at a relatively low cost and maintain it in satisfactory condition, for a term of years if necessary, until the inevitable swing of the pendulum ushers in the never-to-be-forgotten drought, should commend itself to the stockowner as a solution of a very serious problem. However, turn where one will in the rural districts, the silo is the exception rather than the rule! Those who have used ensilage always want more of it; cattle, horses, sheep, and even swine, will eat it readily, and there is no better basis for a ration than this succulent for assisting to maintain animals of all kinds in sleek, healthy condition, particularly when pastures dry out and green feed is not available. It is not possible at this juncture to do more than touch on the importance of the question, but if our State is to keep up a well-earned reputation for its stock products and maintain rich and important associated industries, then the time is more than ripe for a forward move in silo construction. I am confident there is no better asset on a farm and no better stock-insurance can be found than a silo filled with palatable fodder.

In drought-time prices for hay, chaff, and other stock-foods have a habit of soaring up to a figure which hitherto has brought too many people to the verge of bankruptcy in an attempt even to simply keep their stock alive. How to overcome the difficulty of providing the equivalent of green feed, in a form which would keep in fresh condition and carry to any distance, is a matter to which some attention has been given. For the last five years we have been experimenting to ascertain the keeping and carrying qualities of ensilage, taken from silos and stacks. It is a well-known fact that within forty-eight hours after a surface of ensilage is exposed to the air, some signs of deterioration (mould) begin to take place, and to obviate this the usual practice in the silo is to lightly rake over the face of a mass of chaffed fodder, about twice a day, to gather enough food on each occasion for a given number of animals. Different ways of putting up conserved fodder to carry it to a distance, without deterioration, have been tried. We now have satisfactory proof that ensilage taken fresh from a silo or stack, placed in kerosene tins and soldered up, will keep for years; different kinds made from maize, sorghums, panicum, and lucerne have been tried, and in every instance the results conclusively show that an hermetically sealed receptacle is all that is required to keep fodder in sound, wholesome condition almost indefinitely. The life of any form of galvanised iron is, of course, limited, and it was found some years ago that timber-framed silos covered on the inside face with this material required a Portland cement lining to check the corrosive action of the silage juices. Although the kerosene tins used for holding the ensilage experimented with in this way were not dressed with a non-corrosive mixture, they lasted in two instances for four years and eight months, and the contained fodder opened out in fresh palatable condition. We haven't had any precedent to work on in connection with this system, but I feel optimistic concerning the application of the principle, which in drought-time should do much to obviate stock losses and provide fodder at a moderate cost.

TO PROTECT PLANTS FROM SHELL-COVERED SNAILS.

"South African Gardening," replying to the request for a remedy against snails and mealie bug, gives the following as effective remedies:—

For Snails.—Sprinkle powdered alum round their haunts and also round plants or beds of plants to be protected; if this is persisted for a few nights a marked difference will be found. The alum does not appear to hurt vegetation.

For Mealie Bug.—Sprinkle the soil of the pots with naphthaline and just turning it in, say, half a teaspoonful to a 6-in. pot; a little may also be sprinkled on the crown of the plant. In some cases this is a deterrent more than an exterminator.

A PRINCELY CONTRIBUTION.

The London "Times" of 4th February states: A fund opened by the British Minister at Bangkok for relief of the sufferers in the flood disaster at Mackay, in Queensland, has produced over £128,000, including £5,000 from each of the Malay States.

Asparagus, per dozen bundles	...	...	...	...	...	...
Cabbages, per dozen	...	...	...	...	...	2s. to 4s.
Cauliflow'ers (small), per dozen	...	...	...	...	...	1s. 6d. to 2s. 3d.
Beans, per sugar-bag	...	...	...	...	...	2s. 6d. to 5s.
Peas, per sugar-bag	...	...	...	...	...	4s. to 9s.
Carrots, per sugar-bag	...	...	...	...	...	2s. 6d. to 5s.
Chokos, per case	...	...	...	...	...	1s. 10d. to 2s. 3d.
Beetroot, per dozen bunches	...	...	...	...	...	6d. to 9d.
Lettuce, per dozen	...	...	...	...	...	1s. to 1s. 6d.
Parsnips, per dozen bunches	...	...	...	...	...	6d. to 1s.
Sweet Potatoes, per sugar-bag	...	...	...	...	...	1s. to 1s. 3d.
Table Pumpkins, per sack	...	...	...	...	...	5s. to 7s.
Marrows, per dozen	...	...	...	...	...	2s. to 2s. 9d.
Tomatoes, per quarter-case	...	...	...	...	...	2s. to 5s.
Cucumbers, per dozen	...	...	...	...	...	...

SOUTHERN FRUIT MARKETS.

Article.	APRIL.					
	Prices.					
Bananas (Queensland), per case	...	...	...	...	...	9s. to 15s.
Bananas (Fiji), per bunch... ..	...	...	...	...	...	8s. 6d.
Bananas (G.M.), per bunch	...	...	...	...	...	8s. 6d.
Bananas (Tweed River), per bunch	...	...	...	...	...	10s. 0d.
Custard Apples, per tray	...	...	...	...	...	4s. to 6s.
Lemons (local), per bushel-case	...	...	...	...	...	8s. 0d.
Mangoes, per case	...	...	...	...	...	...
Mandarins, per case	...	...	...	...	...	...
Oranges (Navel), per case	...	...	...	...	...	...
Oranges, per bushel-case	...	...	...	...	...	7s. to 8s.
Passion Fruit, per half-bushel case	...	...	...	...	...	8s. to 11s.
Persimmons, per half-bushel case	...	...	...	...	...	1s. 6d. to 3s. 6d.
Pineapples (Queens), per double-case	...	...	...	...	...	...
Pineapples (Common), per double-case	...	...	...	...	...	...
Quinces, per bushel-case	...	...	...	...	...	3s. to 6s.
Tomatoes (Queensland), per quarter case	...	...	...	...	...	...

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	APRIL.					
	Prices.					
Apples, Eating, per case	...	...	...	...	...	4s. to 7s. 6d.
Apples, Cooking, per case	...	...	...	...	...	5s. to 6s. 6d.
Apricots, per case	...	...	...	...	...	...
Bananas (Cavendish), per dozen	...	...	...	...	...	1½d. to 5d.
Bananas (Sugar), per dozen	...	...	...	...	...	4½d. to 5½d.
Cape Gooseberries, per small box	...	...	...	...	...	5s. to 6s.
Cherries, per box	...	...	...	...	...	...
Citrons, per hundredweight	...	...	...	...	...	9s.
Cocanuts, per sack	...	...	...	...	...	15s. to 25s.
Cumquats, per quarter-case	...	...	...	...	...	3s. to 3s. 6d.
Custard Apples, per tray	...	...	...	...	...	2s. 6d. to 5s.
Lemons (Lisbon), per quarter-case	...	...	...	...	...	4s. to 5s. 6d.
Mandarins, per case	...	...	...	...	...	7s. to 10s.
Mangoes, per quarter-case	...	...	...	...	...	...
Oranges (Navel), per case	...	...	...	...	...	...
Oranges (Seville), per hundredweight	...	...	...	...	...	...
Oranges, per case	...	...	...	...	...	3s. 6d. to 7s.
Papaw Apples, per quarter-case	...	...	...	...	...	3s. to 3s. 6d.
Passion Fruit, per half-bushel case	...	...	...	...	...	5s. to 7s.
Peaches, per quarter-case	...	...	...	...	...	...
Pears, per half-bushel case	...	...	...	...	...	15s. to 16s.
Peanuts, per lb.	...	...	...	...	...	4d. to 5d.
Persimmons, per quarter-case	...	...	...	...	...	...
Pineapples (Ripley), per dozen	...	...	...	...	...	1s. 6d. to 2s. 6d.
Pineapples (Rough), per dozen	...	...	...	...	...	1s. to 2s. 6d.
Pineapples (Smooth), per dozen	...	...	...	...	...	1s. 6d. to 4s.
Plums, per quarter-case	...	...	...	...	...	...
Rockmelons, per dozen	...	...	...	...	...	...
Strawberries, per dozen boxes	...	...	...	...	...	...
Tomatoes, per quarter-case	...	...	...	...	...	2s. to 5s.
Watermelons, per dozen	...	...	...	...	...	...

TOP PRICES, ENOGGERA YARDS, MARCH, 1918.

Animal.	MARCH.	
	Prices.	
Bullocks	£18 7s. 6d. to £24	
Cows	£14 15s. to £17	
Cows (Single)	...	
Merino Wethers	40s. 3d.	
Crossbred Wethers	39s.	
Merino Ewes	29s.	
Crossbred Ewes	46s.	
Lambs	38s. 3d.	
Pigs (Baconers)	...	
Pigs (Porkers)	...	
Pigs (Slips)	...	

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF MARCH, 1918, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING MARCH, 1918 AND 1917, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Mar.	No. of Years' Records.	Mar., 1918.	Mar., 1917.		Mar.	No. of Years' Records.	Mar., 1918.	Mar., 1917.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Atherton	8·72	17	9·88	6·59	Nambour	9·88	22	10·13	9·12
Cairns	18·67	36	11·18	11·71	Nanango	3·41	36	2·24	3·10
Cardwell	16·65	46	26·71	12·35	Rockhampton	5·39	31	1·80	8·57
Cooktown	15·28	42	9·60	10·13	Woodford	8·55	31	6·15	5·78
Herberton	8·43	31	7·39	9·98	<i>Darling Downs.</i>				
Ingham	16·48	26	28·95	13·44					
Innisfail	26·00	37	24·04	16·34	Dalby	2·91	48	0·69	2·57
Mossman	20·99	10	10·08	24·25	Emu Vale	2·79	...	0·42	0·96
Townsville	8·36	47	2·54	9·31	Jimbour	2·80	...	0·23	2·35
<i>Central Coast.</i>					Miles	2·97	33	0·45	5·09
Ayr	7·95	31	0·48	4·91	Stanthorpe	2·81	45	0·35	1·04
Bowen	6·15	47	0·77	6·27	Toowoomba	4·02	46	1·12	3·42
Charters Towers	3·75	36	2·28	3·70	Warwick	2·97	31	0·26	0·88
Mackay	12·79	47	7·26	16·91	<i>Maranoa.</i>				
Proserpine	13·14	15	5·38	13·10					
St. Lawrence	6·39	47	1·40	8·90	Roma	3·01	44	0·24	3·57
<i>South Coast.</i>					<i>State Farms, &c.</i>				
Biggenden	4·64	...	2·80	5·04	Bungeworgorai	2·39	4	0·52	3·96
Bundaberg	5·80	35	3·08	10·71	Gatton College	3·70	...	0·54	2·97
Brisbane	5·92	67	3·05	2·79	Gindie	3·30	...	0·65	10·65
Childers	5·50	23	2·43	6·63	Hermitage	2·83	...	0·57	0·80
Crohamhurst	12·30	25	10·79	8·71	Kairi	5·12	4	...	6·01
Esk	5·06	31	1·82	4·02	Kamerunga	17·22	...	12·64	8·81
Gayndah	3·31	47	1·65	2·22	Sugar Experiment				
Gympie	6·50	48	3·17	4·05	Station, Mackay	12·42	...	7·14	11·25
Glasshouse M'tains	9·21	10	8·59	8·64	Warren	3·16	4	2·12	5·49
Kilkivan	4·22	39	1·35	2·92					
Maryborough	6·59	47	4·04	6·04					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for March this year, and for the same period of 1918, having been compiled from telegraphic reports, are subject to revision.

J. H. HARTSHORN, Divisional Officer.

Farm and Garden Notes for June.

FIELD.—Winter begins on the 24th of this month, and frosts will already have been experienced in some of the more exposed districts of the Southern coast and on the Darling Downs. Hence insect pests will, to a great extent, cease from troubling, and weeds will also be no serious drawback to cultivation. The month of June is considered by the most successful lucerne-growers to be the best time to lay down this crop, as any weeds which may spring up in the event of a dropping season will be so slow-growing that the young lucerne plants will not be choked by them.

The land should now be got ready for millets, sorghums, panicum, &c. Oats, barley, vetches, clover, tobacco, buckwheat, field carrots, and Swedes may now be sown. Some advocate the sowing of early maize and potatoes during this month, but obviously this can only apply to the more tropical parts of Queensland. The land may be got ready, but in the Southern districts and on the tableland neither maize nor potatoes should be planted before August, or at the earliest, in warm early districts, at the end of July. There is always almost a certainty of frosts, more or less severe, during these months. Arrowroot will be nearly ready for digging, but we would not advise taking up the bulbs until the frosts of July have occurred. Take up sweet potatoes, yams, and ginger. Should there be a heavy crop, and consequently a glut in the market, sweet potatoes may be kept by storing them in a cool place in dry sand, taking care that they are thoroughly ripe before digging. The ripeness may be known by the milky juice of a broken tuber remaining white when dry. Should the juice turn dark, the potato is unripe, and will rot or dry up and shrivel in the sand pit. Before pitting, spread the tubers out in a dry barn or in the open, if the weather be fine. In pitting them or storing them in hills, lay them on a thick layer of sand; then pour dry sand over them till all the crevices are filled and a layer of sand is formed above them; then put down another layer of tubers, and repeat the process until the hill is of the requisite size. The sand excludes the air, and the potatoes will keep right through the winter. Late wheat may still be sown, but it is too late for a field crop of onions. In tropical Queensland the bulk of the coffee crop should be off by the end of July. Yams may be unearthed. Cuttings of cinnamon and kola-nut tree may be made, the cuttings being planted under bell glasses. Collect divi-divi pods and tobacco leaves. English potatoes may be planted. The opium poppy will now be blooming and forming capsules. Gather tilseed (sesame), and plant out young tobacco plants if the weather be suitable. Sugar-cane cutting may be commenced. Keep the cultivator moving amongst the pineapples. Gather all ripe bananas. Fibre may be produced from the old stems.

KITCHEN GARDEN.—Cabbage, cauliflower, and lettuce may be planted out as they become large enough. Plant asparagus and rhubarb in well-prepared beds in rows. In planting rhubarb it will probably be found more profitable to buy the crowns than to grow them from seed, and the same remark applies to asparagus.

Sow cabbage, red cabbage, peas, lettuce, broad beans, carrots, radish, turnip, beet, leeks, and herbs of various kinds, such as sage, thyme, mint, &c. Eschalots, if ready, may be transplanted; also horse-radish can be set out now.

The earlier sowings of all root crops should now be ready to thin out, if this has not been already attended to.

Keep down the weeds among the growing crops by a free use of the hoe and cultivator.

The weather is generally dry at this time of the year, so the more thorough the cultivation the better for the crops.

Land for early potatoes should now be got ready by well digging or ploughing.

Tomatoes intended to be planted out when the weather gets warmer may be sown towards the end of the month in a frame where the young plants will be protected from frost.

FLOWER GARDEN.—No time is now to be lost, for many kinds of plants need to be planted out early to have the opportunity of rooting and gathering strength in the cool moist Spring time to prepare them for the trial of heat they must endure later on. Do not put your labour on poor soil. Raise only the best varieties of plants in the garden; it costs no more to raise good varieties than poor ones. Prune closely all the hybrid perpetual roses; and tie up, without pruning, to trellis or stakes the climbing and tea-scented varieties, if not already done. These and other shrubs may still be planted. See where a new tree or shrub can be planted; get these in position; then they will give you abundance of spring bloom. Renovate and make lawns, and plant all kinds of edging. Finish all pruning. Divide the roots of chrysanthemums, perennial phlox, and all other hardy clumps; and cuttings of all the Summer bedding plants may be propagated.

Sow first lot, in small quantities, of hardy and half-hardy annuals, biennials, and perennials, some of which are better raised in boxes and transplanted into the open ground, but many of this class can, however, be successfully raised in the open if the weather is favourable. Antirrhinum, carnation, picotees, dianthus, hollyhock, larkspur, pansy, petunia, *Phlox Drummondii*, stocks, wallflower, and zinnias, &c., may be sown either in boxes or open beds; mignonette is best sown where it is intended to remain.

To grow these plants successfully, it is only necessary to thoroughly dig the ground over to a depth of not less than 12 in., and incorporate with it a good dressing of well-decayed manure, which is most effectively done by a second digging; the surface should then be raked over smoothly, so as to remove all stones and clods, thus reducing it to a fine tilth. The seed can then be sown in lines or patches as desired, the greatest care being taken not to cover deeply; a covering of not more than three times the diameter of larger seeds, and a light sprinkling of fine soil over small seeds, being all that is necessary. A slight mulching of well-decayed manure and a watering with a fine-rosed can will complete the operation. If the weather prove favourable, the young seedlings will usually make their appearance in a week or ten days; thin out so as to leave each plant (if in the border) as least 4 to 6 in. apart.

Orchard Notes for June.

THE SOUTHERN COAST DISTRICTS.

The Notes of last month, referring to the care to be taken in the handling and marketing of all kinds of citrus fruits, apply with equal force during this and subsequent months till the end of the season.

Keep the orchard clean, and work the land to retain moisture. The handling of the citrus crop is the main work in many orchards, but where slowly acting manures are to be given their application should not be later than this month. They should be well mixed with the soil, so that when the Spring comes and the trees start a fresh growth a certain percentage of plant food will be available for the trees' use. Heavy pruning should be done now, whilst the trees are dormant. All large limbs should be cut off close to the main stem; the edges of the cuts should be carefully trimmed, and the whole wound, if of large size, covered with paint or grafting wax, so that it will not start to decay but soon grow over. When the soil of the orchard is becoming deficient in organic matter, the growing of a Winter green crop, such as mustard or rape, is well worth a trial. Clear the crop of fruit

from the part of the orchard to be so treated. Plough the land well; work the soil down fine so as to get a good seed bed, and broadcast the mustard or rape. A manuring of 4 cwt. of meatworks manure and 1 cwt. of sulphate of potash per acre will produce a very heavy crop of green manure, and the plant food not required for the production of such crop will be still available for the trees' use in Spring.

Pineapples and bananas should all be cleaned up, and the land got into first-class order. Pineapples, where at all liable to frost, should be covered with grass or other suitable material. The growth of weeds between the rows of pines on land liable to frost is one of the best ways of encouraging frosts, as frost will strike dirty, weedy ground, and severely injure the pines growing thereon, when it will do little, if any, damage where the land is kept perfectly clean—another advantage of cleanliness in cultivation.

THE TROPICAL COAST DISTRICTS.

Keep the land well cultivated—plough when necessary to bury weed growth, and get the surface of the ground into a state of thorough tilth, as moisture must be retained in the soil by cultivation to mature the Spring crop of fruit. This applies not only to oranges and other tree fruits, but to bananas and pines as well. A good start in Spring means good bunches of bananas and early-ripening pineapples. Heavy pruning can be done now in the case of all trees not carrying a heavy crop of fruit; but where citrus trees are heavily loaded, the pruning should be put off till after the Spring crop of fruit has been gathered. The spraying of the trunks and inside of the trees with the lime and sulphur wash can be carried out, and where Maori is making its appearance the sulphide of soda wash should be used as well.

THE SOUTHERN AND CENTRAL TABLELANDS.

The pruning of all kinds of deciduous fruit trees is the chief work of the month in the Stanthorpe district. Do not be frightened to prune severely—first, in the case of young trees, so as to get strong well-grown trees instead of straggling top-heavy trees; and, second, in the case of trees that are going off in the size and quality of their fruit. Where peaches, apricots, plums, or nectarines are only making very little growth and that weak, so that the fruit produced thereon is small, it is advisable to head the tree hard back, so that it will throw out some vigorous branches in Spring that will form a new head for the tree. Apples, as well as plums and apricots, are sometimes inclined to over-produce fruit spurs, which become long and straggling, and bear a large quantity of small-sized fruit. A vigorous shortening back and cutting out of such spurs will have a very beneficial effect in the quality and size of the fruit produced.

Gather and burn all prunings; and where codlin moth is present in the orchard, examine the tree carefully when pruning it, so as to see if there are any cracks, crevices, or masses or loose bark in or under which the larvæ of the moth may be hibernating. All larvæ so found should be destroyed, and if the work is carried out systematically it will tend to materially decrease the crop of moths that will hatch out the following Spring.

As soon as any part of the orchard is pruned, gather up the prunings and work the land, as a thorough winter weathering of the soil is very beneficial in its effects; and, further, it will tend to destroy many insects that may be wintering in it. The planting of new orchards or of trees to replace any that may have died, or that have been proved to be unsuitable to the district, may be continued during the month, and right on till the end of Winter.

Do not prune vines in the Stanthorpe district, as it is advisable to leave the pruning as late as possible, but vine-pruning can be done at any time now in the Roma or Central districts. Tree-pruning can be continued during the month, and the orchard should be kept well worked. Citrus fruits can be marketed. Lemons should be gathered and cured.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE.

1918.	MAY.		JUNE.		JULY.		AUGUST.		PHASES OF THE MOON.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6.13	5.17	6.30	5.0	6.39	5.3	6.30	5.18	The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania.
2	6.14	5.16	6.30	5.0	6.39	5.3	6.30	5.18	
3	6.14	5.15	6.31	5.0	6.39	5.4	6.29	5.19	H. M. 4 May ☾ Last Quarter 8 26 a.m.
4	6.15	5.14	6.31	5.0	6.39	5.4	6.29	5.19	10 " ● New Moon 11 1 p.m.
5	6.15	5.13	6.32	5.0	6.39	5.4	6.28	5.20	18 " ☾ First Quarter 6 14 a.m.
6	6.16	5.13	6.32	5.0	6.39	5.5	6.27	5.20	26 " ○ Full Moon 8 32 a.m.
7	6.16	5.12	6.33	5.0	6.39	5.5	6.27	5.21	The Moon will be nearest the earth on the 8th, and farthest from it on the 20th.
8	6.17	5.11	6.33	5.0	6.39	5.6	6.26	5.21	
9	6.17	5.11	6.34	5.0	6.39	5.6	6.25	5.22	2 June ☾ Last Quarter 2 20 p.m.
10	6.18	5.10	6.34	4.59	6.39	5.7	6.24	5.22	9 " ● New Moon 8 3 a.m.
11	6.19	5.9	6.35	4.59	6.39	5.7	6.23	5.23	16 " ☾ First Quarter 11 12 p.m.
12	6.19	5.9	6.35	4.59	6.39	5.8	6.22	5.24	24 " ○ Full Moon 8 38 p.m.
13	6.20	5.8	6.36	4.59	6.38	5.8	6.21	5.24	The Moon will be nearest the earth on the 5th, and farthest from it on the 17th. It will be 12 times its diam. north of the planet Uranus on the 1st at 7.30 p.m.
14	6.20	5.8	6.36	4.59	6.38	5.9	6.20	5.25	There will be a very partial Eclipse of the Moon on the 24th June, commencing about 7.46 p.m. and ending about 9.10 p.m.
15	6.21	5.7	6.36	5.0	6.38	5.9	6.19	5.26	
16	6.21	5.6	6.37	5.0	6.38	5.10	6.19	5.26	
17	6.22	5.6	6.37	5.0	6.37	5.10	6.18	5.27	
18	6.23	5.5	6.37	5.0	6.37	5.11	6.17	5.27	
19	6.23	5.5	6.38	5.0	6.37	5.11	6.16	5.28	1 July ☾ Last Quarter 6 43 p.m.
20	6.24	5.4	6.38	5.0	6.36	5.12	6.15	5.28	8 " ● New Moon 6 22 p.m.
21	6.24	5.4	6.38	5.1	6.36	5.12	6.14	5.29	16 " ☾ First Quarter 4 25 p.m.
22	6.25	5.3	6.39	5.1	6.36	5.13	6.13	5.29	24 " ○ Full Moon 6 35 a.m.
23	6.25	5.3	6.39	5.1	6.35	5.13	6.12	5.30	30 " ☾ Last Quarter 10 14 p.m.
24	6.26	5.3	6.39	5.1	6.35	5.14	6.11	5.30	The Moon will be farthest from the earth on the 15th, and nearest on the 27th.
25	6.26	5.2	6.39	5.1	6.34	5.14	6.10	5.30	
26	6.27	5.2	6.39	5.2	6.34	5.15	6.9	5.31	7 Aug. ● New Moon 6 30 a.m.
27	6.27	5.2	6.39	5.2	6.33	5.15	6.8	5.31	15 " ☾ First Quarter 8 16 a.m.
28	6.28	5.1	6.39	5.2	6.33	5.16	6.7	5.32	22 " ○ Full Moon 3 2 p.m.
29	6.28	5.1	6.39	5.2	6.32	5.16	6.6	5.32	29 " ☾ Last Quarter 5 27 a.m.
30	6.29	5.1	6.39	5.3	6.32	5.17	6.5	5.33	The Moon will be farthest from the earth on the 12th, and nearest to it on the 24th.
31	6.29	5.0	...	...	6.31	5.17	6.4	5.33	

*For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane at this time of the year.

At Roma the times of sunrise and sunset during May, June, and July, and to the middle of August may be roughly arrived at by adding 20 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night, when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

GRADED SEED WHEAT!

HERMITAGE STATE FARM.

The undermentioned graded wheats (1917 Season) are offered for sale at 5/6 per bushel f.o.b. Hermitage.

Intending purchasers are advised that, owing to unfavourable weather conditions during harvesting, the grain is more or less weathered, and not as plump as usual; satisfactory germination tests, however, have been made.

The varieties consist of Hiawatha, Coronation, Piastre, and O.K., and are of Queensland Origin, and were raised and have been tested over a series of years at Hermitage State Farm, proving to be very suitable to the conditions of soil and climate of the Western Darling Downs.

These varieties are all good Milling Wheats of medium, early-maturing habit, fair rust resisters, and are already well and favourably known to those persons who have given the wheats a trial.

ROMA STATE FARM.

BUNGE 1.

Graded Seed Wheat is offered for sale at 5/6 per bushel f.o.b. Bungeworgorai.

This wheat is somewhat weathered, owing to unfavourable conditions prevalent during harvesting, and from the same cause is not as plump as usual.

Applications, accompanied by Cash Remittance, must be addressed in each case to
THE MANAGER.

Orders will be supplied according to priority of application.

CONSIGN—

WOOL

Wool.—Fenwick & Co. have ample storage for wool; and all consignments of wool, whether large or small, will receive their careful attention.

STOCK

Fenwick & Co. sell Cattle, Calves, Pigs, Sheep, and Lambs every Wednesday at Newmarket. Fenwick & Co. have paddocks handy to Untrucking Yards well grassed, naturally well watered, and with plenty of shade.

SKINS

Fenwick & Co. secure full market value for consignments of Hides, Sheepskins, Marsupial and Opossum Skins, Goat Skins, Tallow, Hair, Beeswax, etc.

TO—

FENWICK & CO., ESTABLISHED 1864,

SALESMEN, EDWARD STREET, BRISBANE,
THEY WILL SECURE FULL MARKET VALUE FOR YOUR CONSIGNMENTS.

Write for Market Reports, Labels, Advice Forms, &c. Liberal Advances available against consignments of Stock, Wool, Hides, etc.

STORE STOCK, STUD STOCK, CITY PROPERTY AND PASTORAL PROPERTY LISTS.

Communicate with Fenwick & Co. if you are a Buyer or Seller.

Fenwick & Co. act as Agents only.

QUEENSLAND AGRICULTURAL JOURNAL

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JUNE, 1918.

PART 6.

Agriculture.

DETERMINATION OF THE KEEPING QUALITIES OF SILAGE.

In connection with the report on experiments made to determine the keeping qualities of ensilage, published in the May issue of the Journal, we have received the following analyses of samples of maize and lucerne kept for different periods in sealed tins by the Agricultural Chemist, Mr. J. C. Brünnich:—

ANALYSES OF SAMPLES OF ENSILAGE—DIRECTOR OF AGRICULTURE.

	1. Maize—Kept in Sealed Tin 8 Months.	2. Maize from Overground Silo—4 years 8 months in Sealed Tin.	Lucerne from Pit Silo— Kept 4 years 8 months in Sealed Tins.
	Per cent.	Per cent.	Per cent.
Water	64·50	70·50	69·00
Dry Matter	35·50	29·50	31·00
Crude Protein	2·69	3·08	3·81
Ash	3·73	3·70	3·72
Crude Fibre	7·10	8·50	11·45
N-free Extract	21·38	13·52	11·22
Ether Extract	0·60	0·70	0·80
Digestible Protein	1·80	2·12	1·81
Amido Nitrogen	0·24	0·24	0·24
Ammonia Nitrogen	0·025	0·067	0·105
Acidity (as Lactic Acid)	1·00	2·25	2·37
	·95—1·7%		2·52%
Percentage Dry Material.			
Crude Protein	7·57	10·45	12·30
Ash	10·50	12·56	12·00
Crude Fibre	20·00	29·90	37·00
N-free Extract	60·24	45·71	36·10
Ether Extract	1·69	2·38	2·60
Per cent. Protein Digestible	67	68	47
Ratio Amido to Total N.	1:1·73	1:2·22	1:2·53
	1:2·35		1:2 +

The figures in the second column, "Maize and Lucerne from Pit Silo," represent the average or usual values for good maize or alfalfa silages of corresponding water content.

The samples of maize ensilage possess a composition in the main corresponding to maize ensilage generally. Such departures as are apparent will be largely resultant upon the actual composition of the ensiled material.

The high acidity of the second maize sample is noteworthy. Considering the acidities normally developed in *lucerne* silage it is, however, probably not excessively high.

The digestibilities of the protein and the protein-non-protein ratios are near normal for these classes of feeds.

Referring to the "nitrogen present as ammonia," the samples sealed for the longer period appear to contain a somewhat high amount. This is taken as indicating that there may have been certain subsidiary changes after removal from the silo which partake of the nature of putrefactive or degenerative alterations. However, in absence of knowledge of the ammonia content of the freshly removed material that such change has occurred cannot be definitely maintained. The appearance and odour of the material would be pronounced satisfactory.

The protein content of the lucerne sample is somewhat low and the fibre high, arising, it is supposed, from the somewhat "stemmy" nature of the sample.

ANALYSIS OF GIANT HONDURAS SORGHUM (EXPERIMENTAL PLOTS)—DIRECTOR OF AGRICULTURE.

	Fresh Material.	Water-free.	Composition Average green Sorghum fodder.	
	Per cent.	Per cent.	Fresh.	Water-free.
Water	70.70	..	75.1	..
Crude Protein	1.51	5.20	1.5	6.0
Ash	1.79	6.20	1.4	5.6
Crude Fibre	13.00	44.80	7.0	28.0
N-free Extract	12.70	42.80	14.0	56.0
Ether Extract	0.30	1.00	1.0	4.0
Digestible Protein	1.01	3.46	1.0	4.0
Percentage Protein Digestible	66.00	..	65-68.00	..
Hydrocyanic Acid	Nil.	..	..	..
Starch Equivalent	14.3	..	16.0 (at correspond- ing water content)	..

The high content of fibre is remarkable, and is attributable to the high proportion of stalk and little flag. To the same cause is attributable, probably also, the slight deficiency in protein.

THE UTILITY OF SEED SELECTION.

Many plants, through natural agencies, are so prone to cross-fertilisation that existent varieties soon lose their best characteristics unless special precautions are taken by the grower to preserve them: with farm seeds the tendency generally is to pay too little attention to their purity and the type and kind sown.

Much can be accomplished by the individual farmer in improving the yield of his crops, by sowing or planting proved strains of seed,

cuttings, tubers, &c., the prolificacy and character of which have been determined, and fixed by judicious selection from high-producing plants.

More land must be cultivated and more fertilisers used when poor-yielding varieties of cultivated crops are raised, and it is obvious that energy and money are to be saved by growing tested varieties of standard commercial value, which, under normal conditions, can be confidently expected to perpetuate their good qualities in the resultant crop.

It is to be recognised also that enhanced yields are to be looked for and better prices obtained by raising crops from acclimatised seed selected with due regard to local conditions, and marketing the more uniform quality of produce to be expected therefrom.

Stockowners are alive to the fact that perfection in animal-breeding, whether for beef or dairy quality, is only attainable by combinations of essential unit characters, and by careful breeding of selection and by systems of feeding to ensure proper individual development. When agriculturists realise that similar principles underlie plant improvement, it is certain their general adoption will do much toward furthering personal welfare and, indirectly, that of the community. The farmer of to-day, for the most part, has little opportunity to consistently follow up the work involved in seed-improvement. As an individual, he has suffered in the past through the introduction of weed seeds and inferior non-pedigree seeds to his land, but now enjoys a measure of protection (hitherto unknown) through the beneficent operations of the Pure Seeds Act.

The initiated well know that whereas certain kinds of seeds can be readily raised here, others must be grown in cooler latitudes and introduced to meet each season's requirements.

The Department of Agriculture has procured and tested from time to time a considerable number and variety of new plants and seeds, and an organisation has been established which aims at the improvement of certain farm crops and the handling and sale of pure seed of these kinds, so that farmers may now have the opportunity of securing acclimatised seed and participating in the benefits to be derived from sowing high-yielding strains, evolved by approved methods of selection.

H. C. QUODLING, Director of Agriculture.

SHORT DESCRIPTIONS OF VARIETIES OF MAIZE, SORGHUMS, &c., ADVERTISED FOR SALE.

Improved Yellow Dent Maize.—Heavy-yielding variety, recommended for coastal districts and scrub lands where there is a good rainfall. Takes from five to six months to mature. Strong grower, attaining over 12 feet in height on rich land. Ears robust, semi-erect in habit, cylindrical in shape, about 10 inches in length and well protected by the husk from the weather and insect attack. Rows 14 to 18 in number; bold, fairly hard type of grain, inclined to wedge shape; somewhat over medium size and of good depth and thickness. Colour rich amber, with characteristic yellow tip, the dent varying from medium to rough. Good fodder corn.

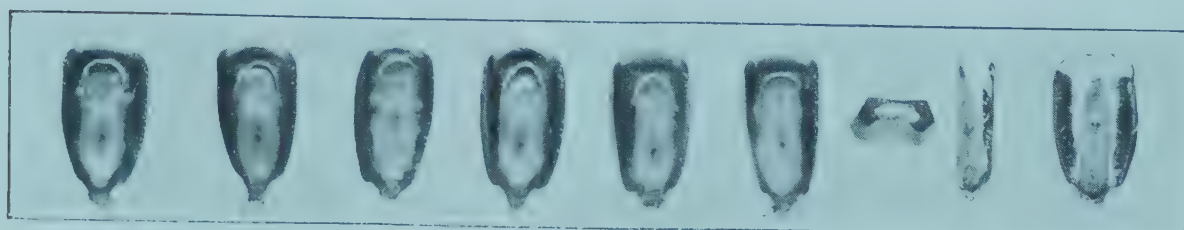
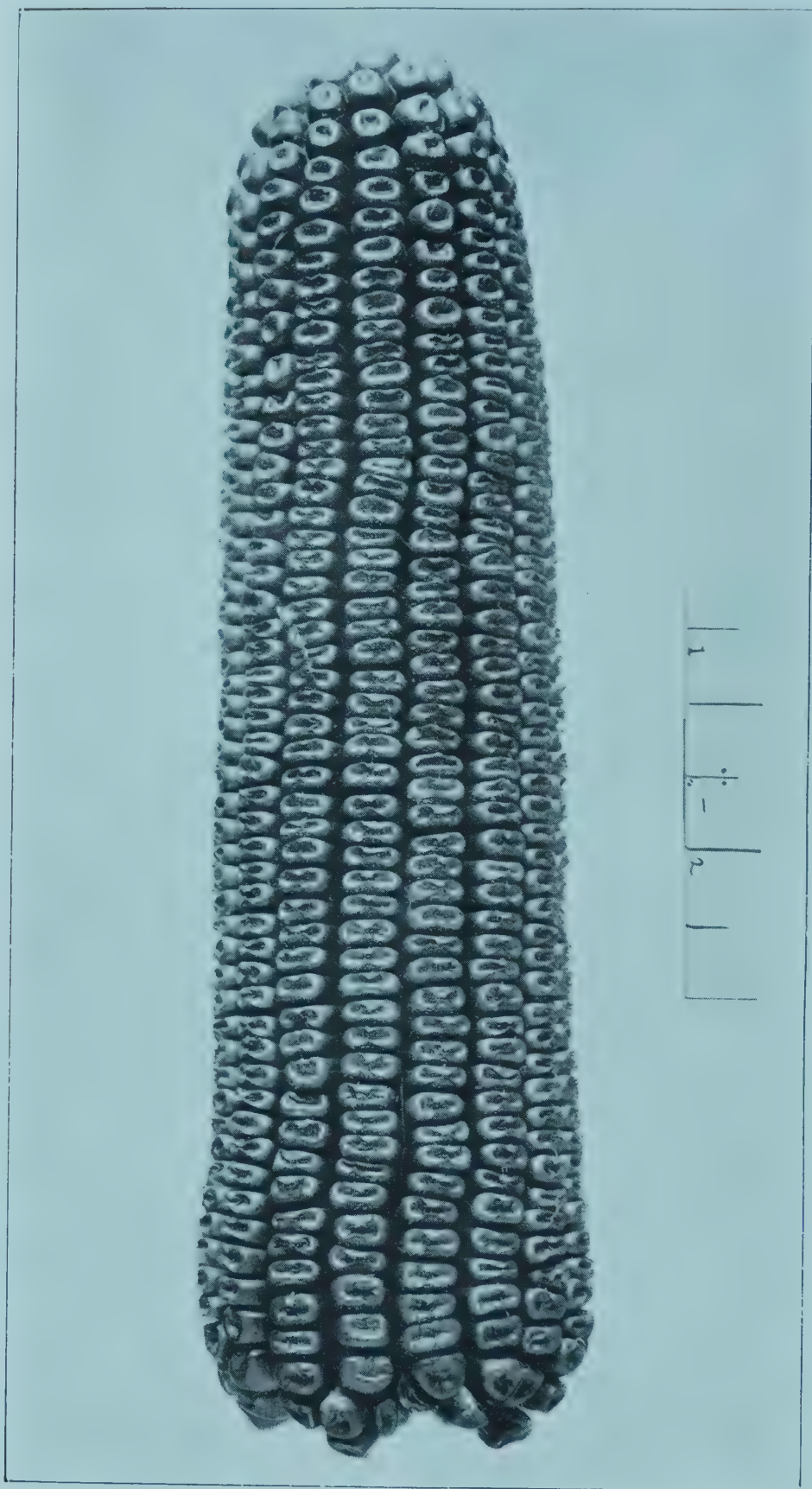


PLATE 15.—IMPROVED YELLOW DENT.

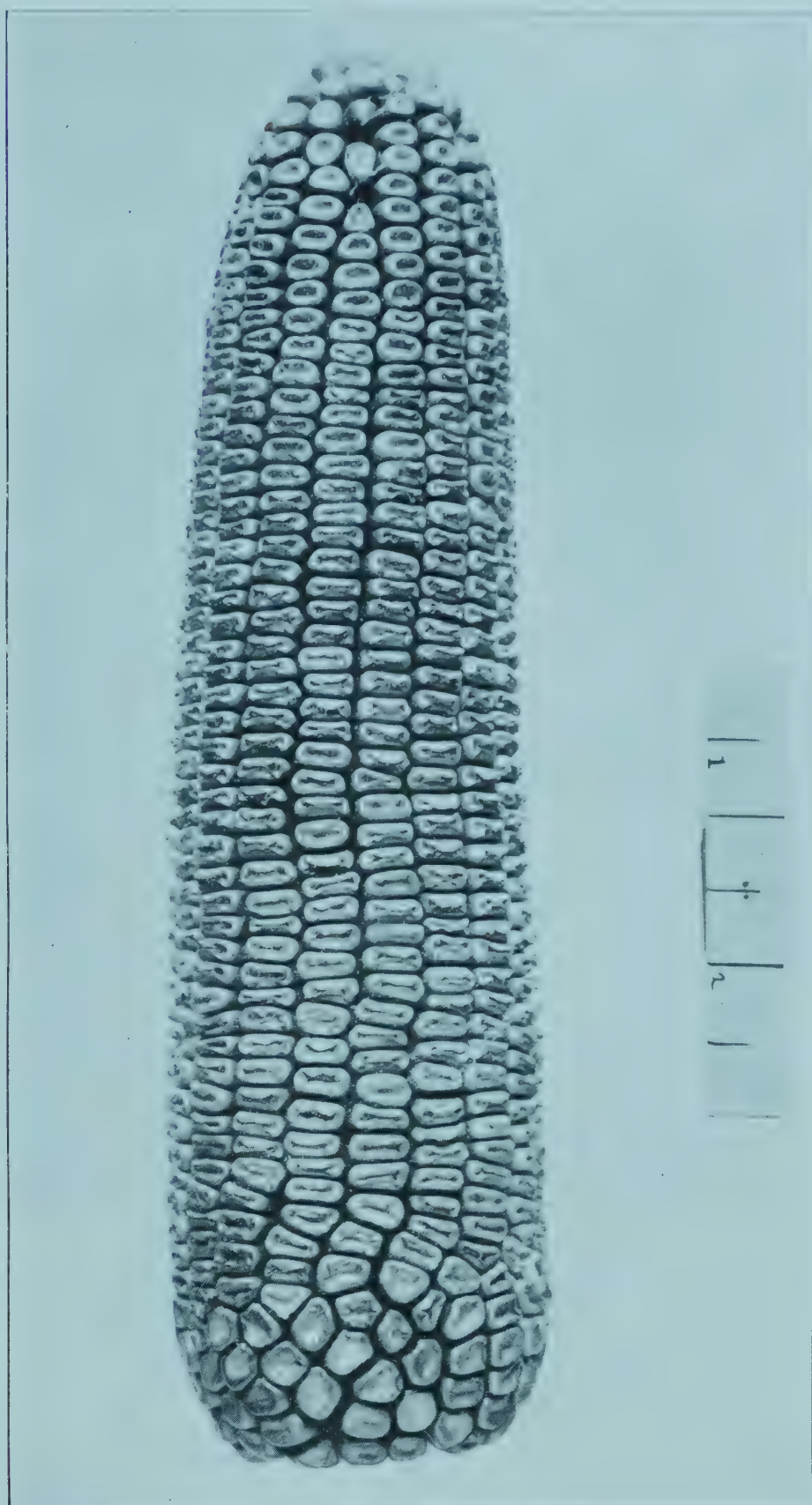


PLATE 16.—STAR LEAMING.

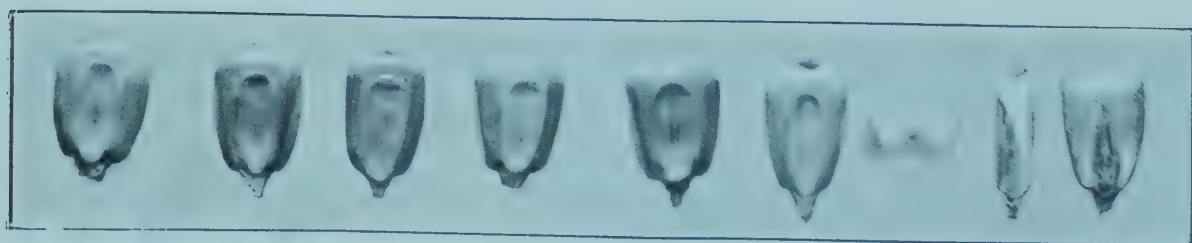
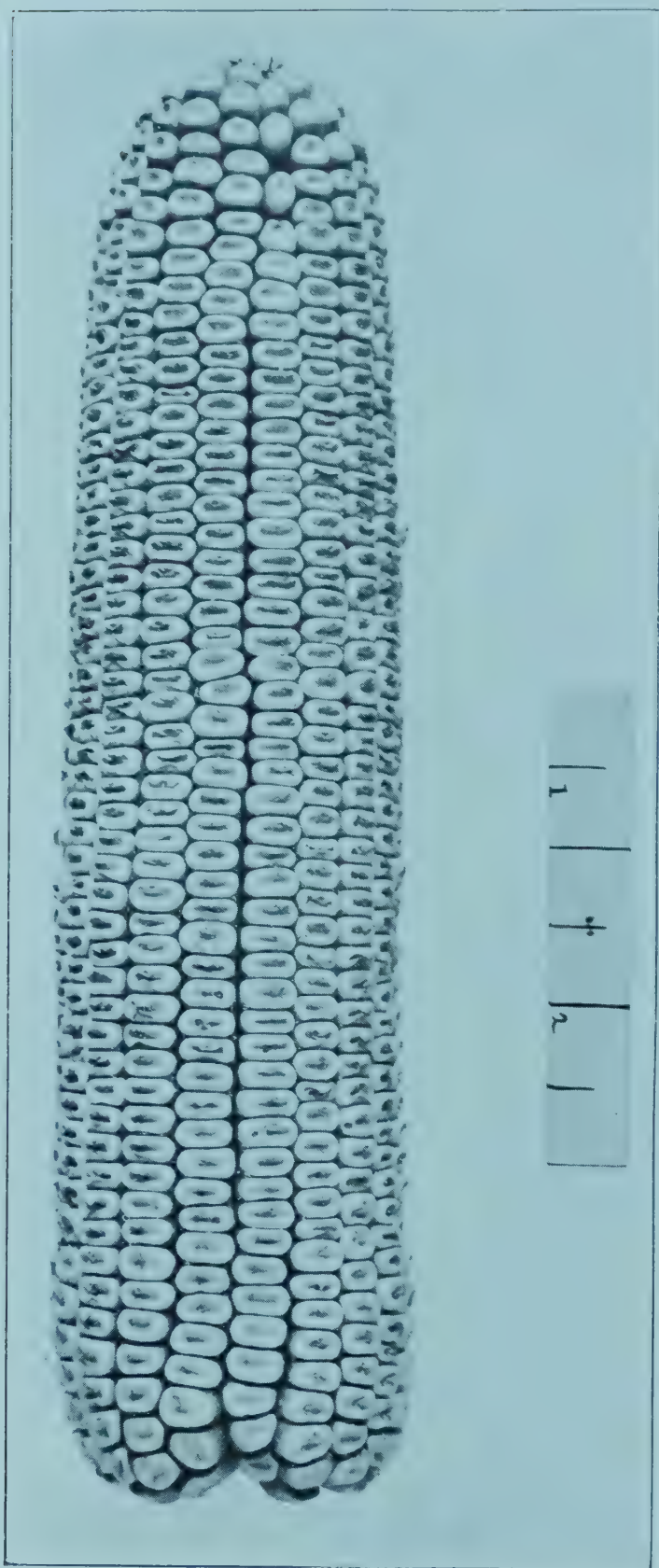


PLATE 17.—BOONE COUNTY WHITE.

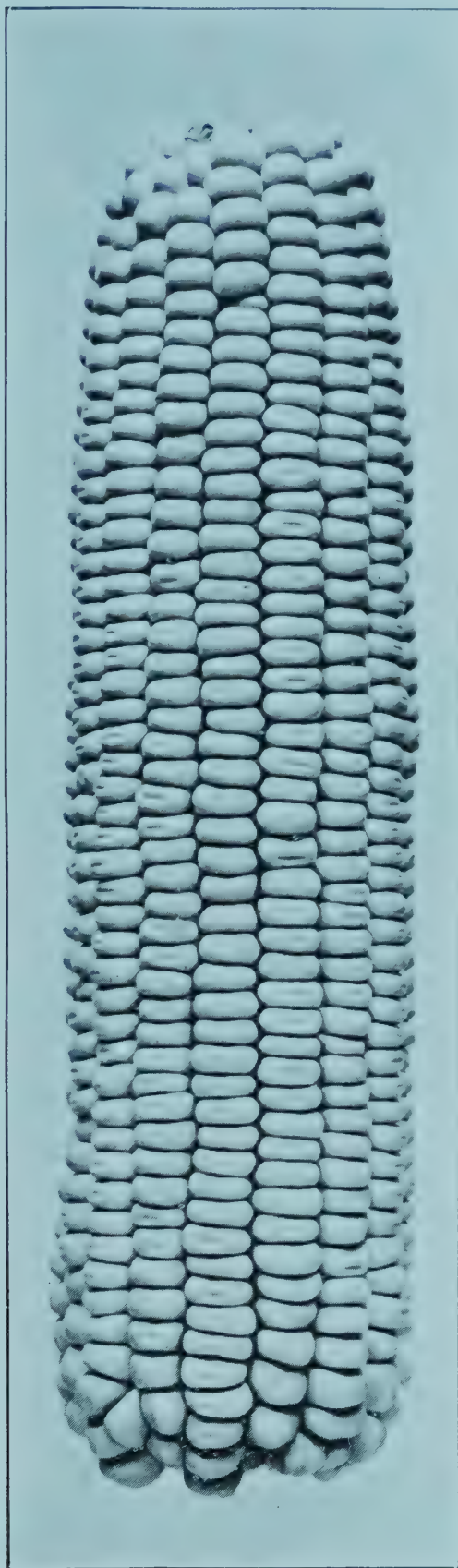


PLATE 18.—BRAZILIAN WHITE.

Hawkesbury Champion.—Heavy-yielding variety when grown on rich alluvial or scrub lands. Requires a long-growing season of six months, and a good rainfall. Very strong grower with robust stalk, up to 14 feet in height. Ears large, up to 12 inches in length; fairly good husk covering. Rows usually 14; very large, bold, flat grain of good thickness. Colour amber, with yellow cap; long smooth dent. This variety has its origin on the rich alluvial lands of the Hawkesbury River, a locality noted for its high yields of maize. Is sometimes called "Golden King."

Star Leaming.—Matures in slightly over 120 days. Recommended for districts where a short season calls for the selection of a quick-maturing hardy type of maize, and where this crop has to be grown on the lighter classes of land. Crop from which seed was secured, tasselled in seven weeks from date of planting. Plants attain a height of from 7 to 8 feet and carry much foliage. Tassels large, bearing abundant pollen; silks plentiful. Ears borne midway on stalk and comparatively long, 9 to 10 inches pendulous, when ripe. Rows of grain 16 to 18 in number, and tightly packed on ears, which fill well at butts and tips. Husk covering light, but affording sufficient protection. Grain blunt-wedge shape; under medium size and of bright amber colour; yellow cap with crease dent.

Reid's Yellow Dent.—Matures in about 125 to 130 days. Had its origin in America over seventy years ago. The ears of this variety are perhaps more perfect in character and appearance than any other maize.

Good results have been obtained on the coast and inland districts up to 320 miles from the seaboard, at the Roma State Farm, indicating the cosmopolitan character of the variety. Plants 8 to 10 feet in height; stalk light, leafy, somewhat inclined to sucker. Tassels bear abundant pollen; silks plentiful. Ears robust, borne slightly above the middle of stalk, length 10 to 11 inches, pendulous when ripe. Rows of grain 18 to 20, closely and tightly packed. Inclination for tip of ear to be exposed when growth is forced on rich lands.

Boone County White.—A standard pearl-white variety, taking 135 to 145 days to mature. Well suited for coastal districts where a good rainfall is experienced. An excellent grain for cornflour manufacturing purposes, and is also a palatable fodder variety on account of its abundance of leaf and the high saccharine content of its stalks. Plants 8 to 10 feet in height. Ears robust, compact, cylindrical in shape, uniform in character, pendulous when ripe, 10 to 11 inches in length. Butts and tips well filled. Grain medium in size, blunt wedge-shape and of medium thickness, 18 to 20 rows to the ear. Husk covering fair. A prolific yielder on good land.

Cornplanter.—The favourite pearl-white variety of the Upper Murray, possessing similar characteristics to Boone County White, only slightly coarser, with somewhat larger grain.

Brazilian White.—The Bread Mealie of South Africa. A soft, starchy maize, useful for cornflour manufacturing purposes, and for making meals for consumption on the farm. Matures in 135 to 145 days;

suitable for coast and intercoastal districts. Plants 8 to 10 feet high, bearing two, and sometimes three, ears to the stalk. Ears compact, of medium size, well filled at butts and tips. Rows of grain regular, 12 to 14 in number. Grain slightly under medium size, smooth, soft, and starchy; creamy-white in colour, with a characteristic smooth dimple dent.

Grain Sorghums.—Yields have been improved by selection. This group of plants is particularly valuable for many reasons, one of which is that they will reproduce themselves and give excellent returns in the face of dry conditions, where maize would fail to give a crop. Excepting "Giant Honduras," which is suited to sub-tropical and tropical conditions, the other varieties, Cream Milo, Feterita, Standard Milo, Dwarf Milo, Shantung, Dwarf Kaoliang, Valley Kaoliang, and Red Kaffir Corn take three and a-half to four months to mature. All have been tested on the coastal and inland areas, and have borne out their reputation for hardihood, and can be recommended for both situations. They will grow in a variety of soils. Tests for grain production have been made, and the yields ran from 50 to 103 bushels per acre; the latter yield being secured at Boonah from Cream Milo. The grain is high in nutritive character, almost equal to wheat. White-coloured (Feterita) and cream-coloured (Cream Milo) make excellent porridge; the others, on account of seed-colour, are not suitable for this purpose, but all make excellent meal. These grains may be used whole or ground for horses, cattle, pigs, and poultry, and are invaluable. No mixed farm should be without its grain-sorghum patch. Spring and summer are the correct seasons to sow seed.

Giant Honduras Sorghum.—Non-saccharine; strong grower, 18 feet; requires rich land and a good rainfall. Takes several months to mature. Fodder yield obtained this season at Toogoolawah, on alluvial land, 41 tons 2 cwt. per acre. Useful as a bulky silage crop, but must not be left too long after it comes into head, as like all non-saccharine sorghums, the stalks become pithy.

Saccharine Sorghums.—The two fodder sorghums—*S. Saccharatum* and Early Amber Cane—have been improved by a system of selection to secure a heavy yielding green fodder strain. Yields from Departmental plots gave 18 and 21 tons per acre, respectively.

Soudan Grass.—Recommended as a hardy, drought-resisting fodder crop, suitable for silage and making a coarse palatable hay. Will grow on almost any class of agricultural land, and yielded over 10 tons of green fodder per acre at the Roma State Farm, on light sandy soil. Can be cut with open-backed reaper and binder. First cutting matures in from eight to ten weeks; a second cutting obtainable, and a light cutting may be expected in the second season.

Phalaris minor (an annual).—A winter and early spring-growing grass, suitable for the Downs. At Hermitage State Farm, on heavy black soil, this grass provided excellent feed for sheep and other stock, and is recommended for trial as a grass to fill a long-felt want.

(See advertisement in this issue.)

MARKET GARDENING.

THE SMALL CABBAGE MOTH.

There will be lots of trouble this autumn and winter from the small cabbage moth, unless readers watch there cruciferous crops carefully. Cruciferous crops are those of the cabbage family, and include the cauliflowers, kales, turnips, &c., of the vegetable garden, and more particularly stocks in the flower garden.

The trouble has already been brought to our notice on several occasions, and it will increase rapidly with the advent of the drier days of winter.

The illustrations reproduced with these notes have been specially prepared by the Division of Entomology with the object of making everyone familiar with the pest,



THE WORK OF THE CABBAGE MOTH.

Showing how leaves are eaten by the larva of the moth, from an illustration by the Division of Entomology.

and the damage it does, in the hope that a united effort may limit its numbers before they increase to such an extent that it is next to impossible to grow a cabbage, &c., free from its unwelcome attentions.

The pest is spread by crops being sent from infested areas to be sold in clean districts. Eggs, larvæ, and cocoons have been regularly found on both bags and crates, and the cabbages themselves. It behoves those whose gardens are free from the pest to guard against introduction in this way by destroying any suspected leaves purchased for culinary purposes.

THE EGG AND LARVA.

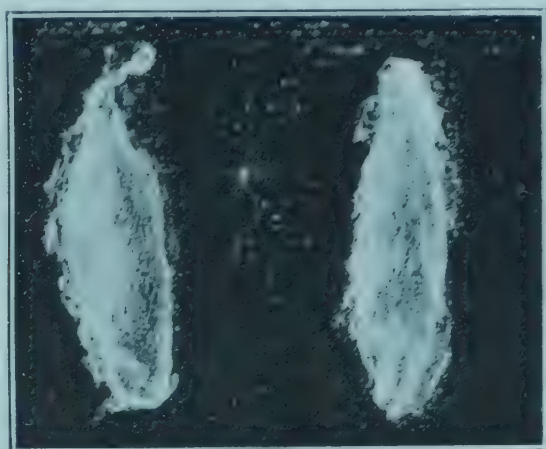
It is proposed to describe the pest as briefly as possible in its various stages of life. Before doing so we wish to acknowledge the assistance in this endeavour afforded by the recent investigations of Mr. D. Gunn, of the Division of Entomology, Pretoria, whose recommendations only enable us to give anything approaching a complete account of the moth. Previous to his investigations little was known of the life history of the pest, and until this is worked out the proper means of combating it cannot be given—the aim being to destroy it at the most vulnerable stage of its life.

The eggs are greenish-yellow, and on account of this colouring it is next to impossible to observe them without a magnifying glass. They are laid on the upper surface of the leaves, usually near the veins.

When the larva emerges from the eggs, it is somewhat less than a fifth of an inch in length, and light-green. After a few days' feeding it assumes a darker colour, and when closely examined a deeper green stripe may be detected down the middle of the back. When full grown the larva is only two-fifths of an inch. It must not be despised, however, on account of its size, as it is capable of doing immense damage. A characteristic liveliness when disturbed, and the fact that after wriggling in an erratic manner it drops either to earth or part of the way, suspended by a silken thread, should make recognition easy. The larval stage lasts about fifteen to eighteen days in summer, and much longer in winter, during which time it feeds on the under surface of the leaves, spinning a gauze-like web over the part of the leaf upon which it happens to be busy.



Larva.

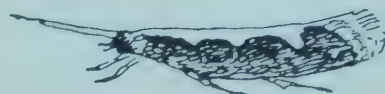


Cocoons.

Pupa removed
from Cocoon.

Adult.

(All enlarged.)



Adult, side view.

THE COCOON AND ADULT.

When mature, the larva encloses itself in a gauze-like cocoon, and gradually becomes a pupa, remaining attached to the under surface of the leaf. In this stage it remains from five to seven days in the summer, and about fourteen days in the winter.

The moth, which emerges, has ash-grey fore wings and light-brown hind wings. The fore wings are covered with a number of black dots, with white stripes on the inner margins, making them appear somewhat diamond-shaped when folded in rest.

They are night flyers, and may frequently be seen around bright lights. When disturbed amongst their food plants during the day they are weak fliers, and never travel far. They only live a few days, from about seven to ten.

From what has been written above, it will be seen that the life of an individual insect is not long, and it may be safely guessed that the number of generations is correspondingly large. During the investigations carried out by Mr. Gunn, ten generations were reared in a few days over a year. The larva of the moth is attacked, and destroyed by several insects—notably the green mantid, but unfortunately it does not appear until about the end of October, by when most of the damage is done.

REMEDIES.

The insect is comparatively easy to control in the larval stage by spraying the plants with the well-known arsenate of lead solution—*i.e.*, 3 lb. arsenate of lead paste or $1\frac{1}{2}$ of powder, dissolved in 50 gallons of water.

The bloom of the cabbage plants prevents the solution adhering really well, and Mr. Gunn found that if 2 lb. of resin were added to each 50 gallons the remedy was much more effective.

Arsenate of lead powder being easier to weigh, it is recommended in preference to paste.

On account of its poisonous nature, arsenate of lead is not recommended for use on mature plants, and for this reason experiments were made with other solutions.

Tobacco extract (one gallon to 50 of water) was found to destroy the larva readily, but whatever brand be used it should contain at least 6 per cent. nicotine, and be non-arsenical. Soap or resin should be added to make the solution more adhesive. Two pounds of either to 50 of water will suffice. It will be found convenient to dissolve them in a little hot water, and add to the bulk solution when dissolved.

In his experiments Mr. Gunn used an insecticide not commonly known to our readers. We thus purpose giving you the recipe in his own words. It is known as

TAR EMULSION, OR TAR WATER,

and is prepared as follows:—Gas or coal tar, 1 gallon; soap, 2 lb.; water, 180 gallons.

As the above quantity may be considered too large to prepare at one time, formulæ for the preparation of smaller quantities are given:—

Gas or coal tar, $1\frac{1}{2}$ bottles, $\frac{3}{4}$ bottle, $\frac{1}{2}$ bottle.

Soap, 9 ounces, 5 ounces, $2\frac{1}{2}$ ounces.

Water, 50 gallons, 25 gallons, 10 gallons.

First place 2 gallons of water in a pot over a fire until it boils. Then place the soap, which has been cut in small pieces, into the water. After the soap has been dissolved, put the tar in the pot, and allow the mixture to cook for two hours. The mixture should be frequently stirred, and after it has been thoroughly cooked, the remainder of the water should be added. It is preferable to spray the preparation immediately after it has become cool, as it has been found by practical experiments that better results are obtained than if it is allowed to stand for some time.

The tobacco and tar mixtures have to be sprayed directly upon the insect to destroy it, and they are therefore known as contact insecticides. As the larvæ invariably feed upon the under-side of leaves of plants, it is essential that an under-spray attachment should be used.

For spraying a small plot in a garden, a bucket or knapsack spray-pump will be found to be satisfactory, but when a field has to be treated, a barrel spray-pump placed on a trolley is necessary, in order to perform the work expeditiously.

Cabbage and cauliflower plants which are grown in seed-beds are liable to become infested with the larvæ of this moth, and they should therefore be sprayed before being planted out in gardens or fields. If this is not done immediately after the larvæ are observed, the leaves may become full of small holes and the plants may become stunted in their growth or even destroyed.

When a garden or field has become infested, all old plants left after the crop has been gathered should be pulled up and either burned or covered in deep pits in the soil. If this is not done, these plants will continue to be breeding places for the insect and cause the infestation of young cabbage and cauliflower plants at a later date.—“South Australian Gardening and Country Life.”

THE VALUE OF THE COMPOST HEAP.

The great value of a compost heap to the market gardener is not generally recognised by those to whom it would be of immense service at all times, but especially at a time like the present, when artificial and indeed most natural animal manures are either unobtainable or obtainable in insufficient quantities. What is a compost heap? The "Farmers' Handbook," issued by the Department of Agriculture of New South Wales, thus describes its composition:—

The compost heap is a most valuable adjunct to the farm, and it is a very great pity that it is not more frequently to be found. A heap or pit can be made very economically, and is of special value in that it utilises all sorts of vegetable and animal refuse, which would otherwise be wasted, and converts it into a valuable manure, rich in organic matter, and eminently suited for soils low in humus or subject to droughty conditions.

The principle of the compost heap is the fermentation of easily-decomposed vegetable matter in the presence of earth and lime. It is not only substances like peat and straw, which form the usual basis of compost heaps, that are thus decomposable, but almost every kind of organic substance, both of vegetable and animal origin, can be thus composted.

Dead leaves, bush scrapings, sawdust, weeds, tops and stalks of vegetables, as well as bone and animal refuse, can be treated in this manner. In the case of animal refuse, the operation is much slower, and substances like bone should be first crushed. It is also important to be sure that animal refuse so treated is not derived from a diseased source.

As a general method of procedure the following will be found satisfactory:—Make a heap with alternate layers of earth, refuse, and lime. Under the term "refuse" is included all the refuse material of animal or vegetable material mentioned above. Cover the whole with a layer of earth. When a sufficient quantity of refuse is again collected, place it on top of the heap and cover with a layer of lime, and lastly of earth, until the heap is 3 or 4 ft. high. The heap should be kept moist, and for this purpose all refuse water from the house, slops, urine, &c., should be added. The heap may be conveniently watered by making a hole into the interior and pouring the liquid in. The outer covering of earth has the object of absorbing any ammonia which is evolved in the process of fermentation and by the action of the lime.

When the heap has been prepared it must be left to itself to ferment for some time. Probably a few months will be sufficient unless very refractory substances, such as bone, &c., are present. In a few months' time it should be well forked over and another layer of lime, and finally of earth, should be added. In the course of another month or two it should be ready for use, and you will have provided yourself at a very slight cost with an excellent manure, rich in humus, and will have utilised for the purpose a great amount of refuse material which would otherwise be lost or burnt.

Instead of a heap the compost may be conveniently prepared in a pit. In either case the bottom should be cemented, or so drained that the liquid escaping from the mass can be collected and returned to the compost.

It will be found advantageous to prepare a second heap while the first one is ripening and being used. It will also be found that if it is desired to use more concentrated fertilisers, such as superphosphates, potash, and ammonium salts, these can be mixed with advantage with the compost manure before being applied to the land. Used in this way they will be in less danger of leaching away, and will be of greater benefit than if applied directly to the land.

A PRINCELY GIFT FROM SIAM.

In the May issue of the Journal we published an extract from the "London Times," in which it was stated that the Federated Malay States had contributed £128,000 to the Mackay Flood Relief Fund. The "Brisbane Courier" made a search for the paragraph in the "Times," but no reference to the announcement could be found. The matter has been cleared up, however, by the receipt of a letter by the Acting-Premier from the Agent-General, in which he says:—"The British Minister at Bangkok has informed the Colonial Office that there is no foundation for the report that a relief fund was raised for the sufferers by the Queensland floods, and he suggests that the Press statements have confused the Mackay Fund with an amount raised for the relief of sufferers from the floods in Siam."

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The Office of the Secretary of the undermentioned Herd Books is 303 Queen street, Brisbane:—

The Australian Hereford Herd Book;
 The Shorthorn Herd Book of Queensland;
 The Jersey Herd Book of Queensland;
 The Illawarra Herd Book of Queensland;
 The Ayrshire Herd Book of Queensland;
 The Milking Shorthorn Herd Book of Queensland;
 The Holstein-Friesian Herd Book of Australia.

NOTE.—Animals registered in the Commonwealth Standard Herd Book are not necessarily eligible for entry in the Jersey Herd Book of Queensland.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
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DAIRY BREEDS.

AYRSHIRES.

L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
J. H. Paten	Gwandalan, Yandina	6	21	Do.
Queensland Agricultural College	Gatton	4	40	Do.
State Farm	Warren	3	83	Do.
J. W. Paten	Ayrshire Park, Wanora, Ipswich	10	42	Do.
J. H. Fairfax	Marinya, Cambooya	9	55	Do.
J. Holmes	"Longlands," Pittsworth	6	20	Do.
H. M. Hart	Glen Heath, Yalangur	7	21	Do.
F. A. Stimpson	Ayrshire Stud, Fairfield, South Brisbane	7	77	Do.
M. L. Cochrane	Paringa Farm, near Cairns	5	21	Do.
John Anderson	"Fairview," Southbrook	7	34	Do.

JERSEYS.

T. Mullen	"Norwood," Chelmer	3	20	Jersey Herd Book of Queensland
Queensland Agricultural College	Gatton	2	31	Do.
M. W. Doyle	"Oaklands," Moggill	4	12	Do.
G. A. Buss	Bundaberg	1	15	Do.
R. Conochie	Brooklands, Tingoorra	9	21	Do.
W. J. Barnes	Millstream Jersey Herd, Cedar Grove	10	37	Do.
W. J. Affleck	Grasmere, N. Pine ..	6	31	Do.
J. N. Waugh and Son	Prairie Lawn, Nobby	3	28	Do.
W. J. H. Austin	Hadleigh Jersey Herd, Boonah	2	11	Do.
State Farm, Kairi	Kairi, <i>via</i> Cairns ..	4	16	Do.
H. D. B. Cox	Sydney (entered in brother's name)	3	16	Commonwealth Standard Jersey Herd Book

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.		Address.		Number of Males.	Number of Females.	Herd Book.
DAIRY BREEDS—continued.						
GUERNSEYS.						
Queensland Agricultural College	Gatton	.. ..	2	2	Eligible, but no Guernsey Herd Book of Australia	
HOLSTEINS.						
Queensland Agricultural College	Gatton	.. ..	2	9	Holstein-Friesian Herd Book of Australia	
George Newman	..	“St. Athan,” Wyreema	12	47	Do.	
F. G. C. Gratton	..	“Towleston,” Kings-thorpe	1	..	Do.	
R. S. Alexander	..	Glenlomond Farm, Coolumboola	1	3	Do.	
Ditto	..	Ditto	1	..	Holstein-Friesian Herd Book of New Zealand	
S. H. Hoskings	..	St. Gwithian, Toogooloowah	..	..	Holstein-Friesian Herd Book of Australia	
C. Behrendorff	..	Inavale Stud Farm, Bunjurgun, Q.	3	9	Do.	
E. Swayne, M.L.A.	..	West Plane Creek, Mackay	1	2	Do.	
ILLAWARRA.						
A. Pickels	.. ..	Blacklands Stud, Wondai	4	62	Illawarra Herd Book of Queensland	
J. T. Perrett and Son	.. ..	Corndale, Coolabunia	2	36	Do.	
W. T. Savage	.. ..	Ramsay	2	22	Do.	
Hunt Bros.	.. ..	Springdale, Maleny ..	3	62	Do.	
MILKING SHORTHORNS.						
P. Young	.. ..	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland	
W. Rudd	.. ..	Christmas Creek, Beaudesert	2	10	Do.	
A. Rodgers	.. ..	Torran’s Vale, Lane-field	1	9	Do.	
W. Middleton	.. ..	Devon Court, Crow’s Nest	3	27	Do.	
BEEF BREEDS.						
SHORTHORNS.						
T. B. Murray-Prior	.. ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books	
C. E. McDougall	.. ..	Lyndhurst Stud, Warwick (2)	25	100	Queensland Shorthorn Herd Book	
Godfrey Morgan	.. ..	“Arubial,” Condamine	3	6	Do.	
W. B. Slade	.. ..	E. Glengallan, Warwick	2	20	Do.	

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
BEEF BREEDS— <i>continued.</i>				
HEREFORD.				
A. J. McConnell ..	Dugandan, Boonah	19	36	Australian Hereford Herd Book
E. M. Lumley Hill ..	Bellevue House, Bellevue	45	127	Do.
Tindal and Son ..	Gunyan, Inglewood	50	400	Do.
SUSSEX.				
James T. Turner ..	The Holmwood, Neurum	2	4	Sussex Herd Book of England

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RETURNS OF COWS FROM 30TH MARCH, TO 29TH APRIL, 1918.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%.	Lb.	
Lady Melba ...	Holstein ...	31 Mar., 1918	1,176	3.5	45.54	
Leda's Jessie ...	Jersey ...	25 Mar. "	534	5.5	34.75	
Lady Margaret ...	Ayrshire ...	27 Dec., 1917	693	4.4	34.22	
Leading Lady ...	Jersey ...	26 Dec. "	459	6.2	33.69	
Constancy ..	Ayrshire ...	7 April, 1918	601	4.8	32.52	
Miss Bell ...	Jersey ...	27 June, 1917	452	5.8	31.00	
Violette's Peter's Girl	" ...	26 Oct. "	434	5.8	29.77	
Sweet Meadows ...	" ...	8 Aug. "	407	6.0	28.92	
Netherton Belle ...	Ayrshire ...	17 July "	464	5.2	28.48	
College St. Margaret	Jersey ...	9 Nov. "	426	5.6	28.19	
Burlesque ...	" ...	6 Oct. "	345	6.4	26.07	
Jeannie ...	Ayrshire ...	13 Dec. "	607	3.7	24.98	
College Bluebell ...	Jersey ...	28 June "	345	6.1	24.90	
Thornton Fairetta	" ...	30 June "	296	7.0	24.59	
Hedge's Nattie ...	Holstein ...	1 Feb., 1918	663	3.3	24.06	
Lady Spec... ..	Ayrshire ...	19 Feb. "	731	3.0	24.06	
College Damsel ...	Holstein ...	12 July, 1917	478	4.4	23.70	
Miss Edith... ..	Jersey ...	23 Dec. "	503	4.2	23.66	
Royal Mistress ...	Ayrshire ...	13 Mar., 1918	513	4.1	23.52	
Songstress ...	" ...	1 Oct., 1917	402	4.9	22.22	
Mistress Bee ...	Jersey ...	23 Jan., 1918	546	3.6	21.84	
Comedienne ...	" ...	13 Dec., 1917	378	5.1	21.78	
Iron Plate ...	" ...	14 Oct. "	505	3.8	21.38	
Miss Edition ...	" ...	12 Nov. "	469	4.0	20.96	
College Ma Petite	" ...	10 Nov. "	411	4.5	20.78	
Lady Dorset ...	Ayrshire ...	14 Aug. "	451	4.2	20.71	
Belinda ...	" ...	14 Jan., 1918	568	3.3	20.70	
Lady Peggy ...	" ...	30 Mar. "	515	3.6	20.60	
Hedge's Madge ...	Holstein ...	22 Mar., 1917	361	5.0	20.37	
Hedge's Dutchmaid	" ...	9 Sept. "	523	3.5	20.29	

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, APRIL, 1918.

The Dixie egg plant wins the monthly prize with 139 eggs, while W. Smith leads in the heavy breed with a score of 105. The birds have settled down well. The number of cases of false moults have been so few that they are not worth mentioning. A few birds paled off, but show signs of an early commencement of laying again. Several birds were treated for minor ailments and recovered. There were three cases of broodiness amongst the heavy breeds. Taking things all through, progress appears to be very satisfactory. The weather conditions have been excellent. The following are the individual records:—

Competitors.	Breed.	April.
LIGHT BREEDS.		
*Dixie Egg Plant	White Leghorns ...	139
*Mrs. L. Henderson	Do.	114
*T. Fanning	Do.	104
Progressive Poultry Farm	Do.	104
Harold Fraser	Do.	103
B. Caswell	Do.	101
*Range Poultry Farm	Do.	99
*E. Chester	Do.	95
*Dr. E. C. Jennings	Do.	95
*L. G. Innes	Do.	95
*C. Knoblauch	Do.	93
*O.K. Poultry Yards	Do.	92
*W. Becker	Do.	91
*Geo. Prince	Do.	90
*C. P. Buchanan	Do.	86
*G. W. Hindes	Do.	85
G. Williams	Do.	82
S. Wilkinson	Do.	80
*G. Howard	Do.	76
*G. H. Turner	Do.	74
*Chris. Porter	Do.	71
O. W. J. Whitman	Do.	71
*Thos. Taylor	Do.	70
Mrs. L. F. Anderson	Do.	69
*Oakland Poultry Farm	Do.	67
J. J. Davies	Do.	67
*W. Lovell	Do.	64
H. F. Britten	Do.	64
*Mrs. A. T. Coomber	Do.	63
*Quinn's Post Poultry Farm	Do.	62
*J. W. Newton	Do.	62
*T. B. Hawkins	Do.	61
*E. A. Smith	Do.	60
*J. Zahl	Do.	52
Geo. Trapp	Do.	52
Mrs. A. G. Kurth	Do.	50
*Homalayan Poultry Farm	Do.	49
H. B. Stephens	Do.	44
R. T. G. Carey	Do.	41
*J. M. Manson	Do.	40

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	April.
LIGHT BREEDS— <i>continued.</i>		
B. Chester	White Leghorns ...	37
*Rupert Holmes	Do.	36
P. O. Oldham	Do.	34
*Mrs. R. Hunter	Do.	20
A. W. Walker	Do.	13
Shaw and Stevenson	Black Leghorns ...	8
W. A. Wilson	White Leghorns ...	3

HEAVY BREEDS.

*W. Smith	Black Orpingtons ...	105
*W. H. Reilly	Chinese Langshans ...	95
*A. E. Walters	Black Orpingtons ...	92
*Nobby Poultry Farm	Do.	89
T. Hindley	Do.	67
*E. F. Dennis	Do.	51
W. J. Mee	Do.	51
H. Puff	Rhode Island Reds ...	49
*E. Morris	Black Orpingtons ...	48
*J. W. Macrae	Do.	40
*D. Fulton	Do.	35
E. M. Larsen	Do.	24
*Mars Poultry Farm	Do.	12
*R. Burns	Do.	10
Jas. Fitzpatrick	Rhode Island Reds ...	4
*F. A. Claussen	Do.	0
A. Shanks	Black Orpingtons ...	0
Th. W. Lutze	Do.	0
Total	...	4,000

* Indicates that the pen is engaged in single hen test.

SINGLE HEN PEN RESULTS.

Competitor.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
Dixie Egg Plant	21	21	26	21	24	26	139
Mrs. L. Henderson	21	21	18	11	22	21	114
T. Fanning	16	17	20	15	19	17	104
Range Poultry Farm	14	21	17	18	11	18	99
E. Chester	12	22	13	19	22	7	95
Dr. Jennings	18	15	20	19	18	5	95
L. G. Innes	3	22	22	18	10	20	95
C. Knoblauch	10	5	21	14	22	21	93
O.K. Poultry Yards	19	17	18	6	16	16	92
W. Becker	10	17	15	18	13	18	91
Geo. Prince	2	17	18	19	19	15	90
C. P. Buchanan	16	4	19	8	20	19	86
G. W. Hindes	25	21	16	16	6	1	85
G. Howard	9	9	17	9	16	16	76
G. H. Turner	0	12	16	13	20	13	74
Chris. Porter	0	18	9	16	13	15	71
Thos. Taylor	20	16	17	0	6	11	70

SINGLE HEN PEN RESULTS—*continued.*

Competitors.	A.	B.	C.	D.	E.	F.	Total.
Oakland Poultry Farm	8	13	21	16	2	7	67
W. Lyell	19	17	16	12	0	0	64
Mrs. A. T. Coomber	9	10	10	6	10	18	63
Quinn's Post Poultry Farm	16	16	1	10	18	1	62
J. W. Newton	15	16	1	4	19	7	62
T. B. Hawkins	11	1	18	8	16	7	61
E. A. Smith	0	23	5	17	15	0	60
John Zahl	14	12	3	10	7	6	52
Homalayan Poultry Farm	17	12	6	0	14	0	49
J. M. Manson	21	3	13	1	1	1	40
R. Holmes	17	10	0	2	1	6	36
Mrs. R. Hunter	1	17	0	0	1	1	20

HEAVY BREEDS.

W. Smith	21	24	2	15	20	22	105
W. H. Reilly	23	19	14	12	9	18	95
A. E. Walters	16	17	13	19	20	7	92
Nobby Poultry Farm	21	18	13	6	9	22	89
E. F. Dennis	21	0	7	0	18	5	51
E. Morris	1	16	16	15	0	0	48
J. W. Macrae	0	0	13	0	17	10	40
D. Fulton	3	2	4	2	1	23	35
Mars Poultry Farm	0	0	12	0	0	0	12
R. Burns	0	0	0	0	9	1	10
F. A. Claussen	0	0	0	0	0	0	0

FINAL REPORT OF THE FOURTEENTH EGG-LAYING COMPETITION.

The fourteenth egg-laying competition at the Queensland Agricultural College was concluded on 31st March, 1918. In all, 438 birds competed, 318 in group pens, while the balance of 120 were tested singly. It has again been demonstrated that the group system can in no way compare with the single hen testing, and it is certain that competitors generally will look forward to the time when group pens are a thing of the past.

WEATHER CONDITIONS.

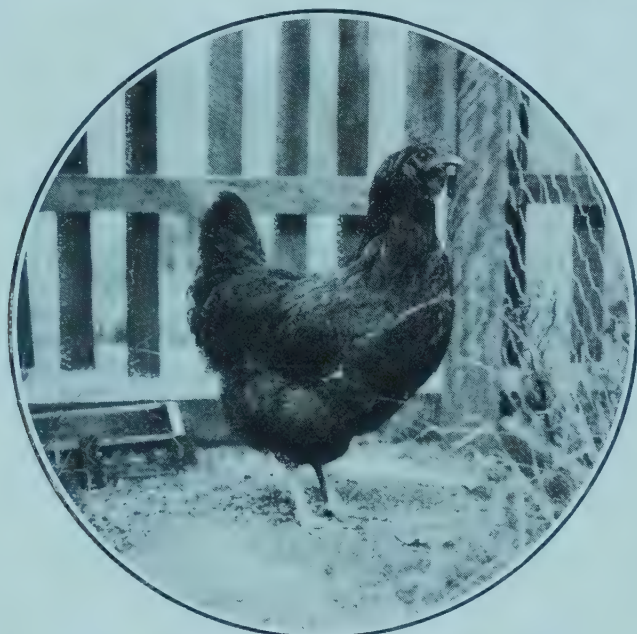
The past year has been very unfavourable. From the beginning of April until the beginning of September conditions were exceptionally dry, heavy westerly winds extending over weeks being characteristic. From September to the end of January we were deluged with excessive rain, which kept the pens sodden and forced the birds to remain in their houses for days at a time. To these exceptional conditions can be attributed the lower total yield.



Mr. R. Burns's "E" Bird.



Mr. E. F. Dennis's "D" Bird.



Mr. R. Burns's "F" Bird—335 eggs in 365 days.



Mr. J. M. Manson's "F" Bird.



Mrs. J. R. D. Munro's "A" Bird.

FEEDING.

The quality of the feed used for the birds was, on the whole, very poor. Owing to the poorness of the pollard, at times it required fully three parts of pollard to one part of bran to get a balanced ration, instead of the usual ratio of two to one. Good pollard seems to be unprocurable, having in some cases a resemblance to fine bran, while in other cases it has a dark colour with an appearance of containing some foreign matter. Dried blood was used for animal food, 5 per cent. being added to the morning mash after the expiration of the first month of the competition, this quantity being increased to 7 per cent. during months when the birds were in full lay. The birds were brought gradually to the blood, as there is a danger of serious harm being caused by feeding to birds that had not received stimulating food prior to entering the competition. It would be advisable that all intending competitors should bear in mind that better results from their birds would be obtained if they kept them on a moderate ration before sending forward. There would not then be the number of birds breaking into partial moults and getting checks. Very little bonemeal was used, as, in our opinion, lime and ash can be fed to the birds in a more digestible form. Four per cent. Sunlight oilcake was fed. No condiments were used, with the exception of a small quantity of spice, which was given during the continuance of the westerly winds and the worst wet weather. Green lucerne and sow thistles were used as green foods, fed to the birds last thing in the evening, and given in sufficient quantity to provide for some being left in the morning, when it was almost as fresh as when given the night before. Soup meat was fed twice a week in the middle of the day; but, unfortunately, it was unprocurable during part of the winter and at a time when the meat would have been most beneficial, if only to give the birds exercise running about with it. Charcoal and shell grit were always before the birds.

GENERAL RESULTS.

The egg production was not satisfactory, the average being the lowest obtained in the College competitions. On the other hand, two records were established. A Black Orpington hen owned by Mr. R. Burns, Sladevale, Warwick, laid 335 eggs in 365 days, while Mr. E. Chester's pen of White Leghorns established a new Queensland record of 1,661 eggs for six hens in 365 days. In both these cases the birds were allowed to continue until 2nd April, so as to complete the full 365 days. It is to be regretted, however, that in both of these cases the birds were disqualified from taking prizes, as the eggs laid were below the standard of 24 oz. to the dozen.



PLATE 20.—THE HEADS OF MR. R. BURNS'S PEN OF BLACK ORPINGTONS.

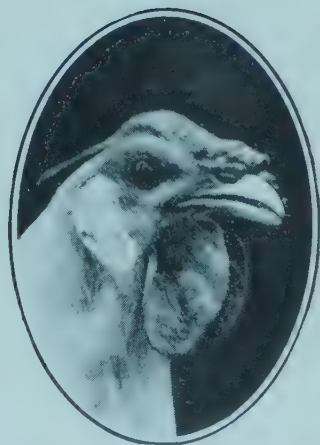
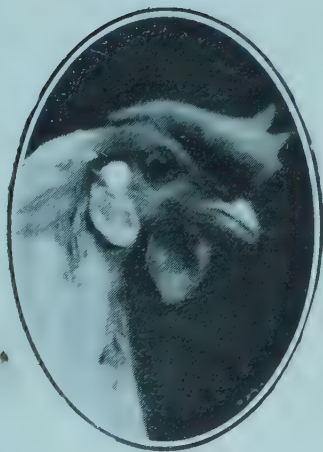


PLATE 21.—THE HEADS OF MR. E. CHESTER'S PEN.

HEALTH OF STOCK.

Considering the most unfavourable weather the birds had to experience, the general health has been splendid. Only one death resulted from roup, which seems remarkable, when it has to be taken into consideration that the birds were confined to their perches at times for a week at a stretch. Long periods elapsed between the times that the ground was in a fit state for the birds to have a dust bath. There were six cases of consumption or wasting disease. Two, which were also at the same time wasting, died from heat. Six were lost through ovarian trouble, three of which were cases of broken blood vessels through straining on the nest. Two died from enteritis and one from enlarged liver. Total number of deaths, eighteen.

There were several birds which required medical treatment, and these, in some cases, spoiled their owners' chances of gaining a prominent position in the competition. The suggestion of destroying such birds and having them replaced is a matter which should receive attention at the next Queensland Poultry Conference.

BROODIES.

Broodiness has been troublesome throughout the competition. There were 554 cases recorded, the highest number for a group of six hens being 47, while other groups gave 38, 36, 35, 33, 30, 29, 25, 23, 22, and downwards. It is possible that the excessive wet weather may have been partly responsible for the excessive broodiness, for it is quite conceivable that the maternal instinct to brood might have been encouraged under conditions which gave no inducement for the birds to leave the nest for a less favourable position on the perch, while giving them the satisfaction of feeling a number of eggs under them.

WEIGHT OF EGGS.

In the College competition great importance is attached to the average weight of eggs. In conformity with the opinions generally accepted, a standard of 24 oz. to the dozen has been adopted. In August the eggs of birds in the competition were weighed, and, finding that the weights were disastrously low, a second weighing was carried out, as it was thought that the violent windy weather obtaining during the first weighing might have had a lowering influence. But the second weighing confirmed the first results, and at various times since then eggs of some birds and pens have been weighed and showed practically no change over those obtained in August. Thus the weights published have been confirmed, and they disclose a very unfortunate prevalence of small eggs in our various flocks. It certainly is no advantage for eggs

to be too large, but it is equally a disadvantage for eggs to be too small, and we think that breeders could, with advantage to themselves, devote more attention to this side of egg production.

TYPE.

The types of the competing birds were most variable, and show most emphatically that severe steps must be taken to save some of the breeds from losing every resemblance to their standard. Although the utility societies of the Commonwealth have drawn up a standard for utility purposes, there are, however, certain flaws in it that must be rectified for the good of several breeds. A number of competitors seem to be under the impression that, when more size and closer approach to the standard were asked for, what was required was the biggest and often the coarsest birds they could pick up in their yards. The consequences have been—less eggs, more broodiness, bad average, and disappointment.

The full returns of eggs laid, prize lists, and balance-sheet are attached.

WEIGHTS OF EGGS.

The following table of results shows the weight of the eggs to the nearest eighth of an ounce:—

Pen.	Competitor.	Average Weight. Oz.	Pen.	Competitor.	Average Weight. Oz.
1	Miss Hinze	2 ¹ / ₈	28	R. Holmes	2 ¹ / ₄
2	W. Thomas (Quinn's) ..	2	29	W. Becker	2
3	F. W. Leney	1 ³ / ₄	30	C. P. Buchanan	2
4	Moritz Bros.	2	31	Mrs. Carruthers	2 ¹ / ₈
5	T. B. Hawkins	2	32	G. Williams	2
6	Oakland Poultry Farm ..	2 ¹ / ₄	33	Mars P. Farm	2 ¹ / ₈
7	C. Porter	2	34	A. Shilling	2
8	T. A. Pettigrove	2	35	G. Howard	1 ³ / ₄
9	E. A. Smith	2	36	G. J. White	2 ¹ / ₈
10	C. Knoblauch	1 ⁷ / ₈	37	J. H. Newton	1 ⁷ / ₈
11	J. Ferguson	2 ¹ / ₈		<i>Heavy Breeds.</i>	
12	E. Chester	1 ⁷ / ₈			
13	D. Fulton	2	38	H. Jobling	2 ¹ / ₈
14	G. Chester	1 ⁷ / ₈	39	D. Kenway	2
15	Mrs. S. J. Sear	2	40	R. Burns	1 ⁷ / ₈
16	L. G. Innes	2	41	King and Watson	1 ⁷ / ₈
17	C. H. Singer	1 ⁷ / ₈	42	Mrs. J. H. Jobling	2 ¹ / ₈
18	E. Cross	2	43	P. C. McDonnell	1 ⁷ / ₈
19	J. Holmes	2 ¹ / ₈	44	Cowan Bros.	2
20	T. Taylor	1 ⁷ / ₈	45	F. Clayton	2 ¹ / ₈
21	Kelvin P. Farm	1 ⁷ / ₈	46	C. B. Bertelsmeier	1 ⁷ / ₈
22	W. R. Crust	2	47	A. E. Walters	2
23	J. G. Richter	1 ⁷ / ₈	48	W. Smith	1 ⁷ / ₈
24	S. C. Chapman	1 ⁷ / ₈	49	E. Morris	1 ³ / ₄
25	Mrs. W. D. Bradburne ..	2 ¹ / ₈	50	J. M. Manson	2
26	A. H. Padman	2	51	C. C. Dennis	2
27	F. Clayton	2	52	W. G. Hansen	2
			53	F. A. Claussen	2 ¹ / ₈

SINGLE HEN PEN.

No.	Competitor.	A.	B.	C.	D.	E.	F.	Group.
		Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
1	C. C. Dennis	$2\frac{1}{8}$	2	2	$2\frac{1}{8}$	$2\frac{1}{8}$	$1\frac{7}{8}$	2
2	J. M. Manson	2	$1\frac{7}{8}$	$2\frac{1}{8}$	2	$2\frac{1}{8}$	2	2
3	Mrs. J. R. Munro	2	2	2	2	$2\frac{1}{8}$	2	2
4	A. E. Walters	2	2	$2\frac{1}{8}$	2	$1\frac{7}{8}$	$1\frac{7}{8}$	2
5	G. H. Turner	$2\frac{1}{4}$	$1\frac{7}{8}$	2	$1\frac{7}{8}$	$2\frac{1}{8}$	2	2
6	J. Zahl	2	$2\frac{1}{4}$	$1\frac{7}{8}$	$2\frac{1}{8}$	2	2	2
7	J. R. Wilson	2	2	$2\frac{1}{4}$	$2\frac{1}{8}$	$1\frac{7}{8}$	2	2
8	T. Fanning	2	2	$1\frac{7}{8}$	2	$2\frac{1}{8}$	2	2
9	Dixie Egg Plant	2	2	$2\frac{1}{8}$	$2\frac{1}{8}$	2	..	2
10	Dr. Jennings	$1\frac{5}{8}$	2	$1\frac{3}{4}$	2	2	2	$1\frac{7}{8}$
11	A. W. Bailey	..	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{8}$	$2\frac{1}{4}$
12	A. T. Coomber	$2\frac{1}{8}$	$2\frac{1}{8}$	$1\frac{7}{8}$	2	$2\frac{1}{8}$	2	2
13	Mars P. Farm	2	$1\frac{1}{8}$	2	2	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{7}{8}$
14	E. A. Smith	$1\frac{7}{8}$	$2\frac{1}{8}$	$1\frac{7}{8}$	$1\frac{7}{8}$	$2\frac{1}{4}$	2	2
15	R. Burns	$2\frac{1}{4}$	2	$2\frac{1}{4}$	2	$2\frac{1}{8}$	$1\frac{3}{4}$	$2\frac{7}{8}$
16	Kelvin P. Farm	$1\frac{3}{4}$	2	$1\frac{7}{8}$	$1\frac{7}{8}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{7}{8}$
17	Miss Hinze	$2\frac{1}{8}$	2	$1\frac{7}{8}$	2	$1\frac{7}{8}$	$2\frac{1}{8}$	2
18	E. F. Dennis	$1\frac{7}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{3}{4}$	$1\frac{3}{4}$	2	$1\frac{7}{8}$
19	Oakland P. Farm	$1\frac{3}{4}$	$1\frac{3}{4}$	2	..	$1\frac{7}{8}$	2	$1\frac{7}{8}$
20	F. W. Leney	$1\frac{7}{8}$	$2\frac{1}{8}$	$1\frac{7}{8}$	$1\frac{7}{8}$	2	$2\frac{1}{8}$	2

TRUE TO TYPE.

The following pens were declared ineligible for the True to Type prizes:—

H. Jobling, N.S.W.	Black Orpingtons
F. Clayton, N.S.W.	Rhode Island Reds
R. Burns	Black Orpingtons
T. B. Hawkins	White Leghorns
T. A. Pettigrove	Do.
C. Knoblauch	Do.
D. Fulton	Do.
W. R. Crust	Do.
T. Taylor	Do.
C. C. Dennis	Do.
J. Zahl	Do.
W. Bailey	Do.

PRIZE MONEY ALLOTTED.

LIGHT BREEDS.

G. H. Turner—	£	s.	d.	£	s.	d.
Divided first and second general aggregate	3	13	6			
Divided first and second true to type aggregate	2	12	6			
Second winter test	2	2	0			
Third single test	1	1	0			
				9	9	0
J. M. Manson						
Third general aggregate	2	2	0			
Third true to type aggregate	1	1	0			
First single test	3	3	0			
Monthly prizes—June, Sept., Oct., Nov., Dec.	2	12	6			
				8	18	6
W. Becker—						
Divided first and second general aggregate	3	13	6			
Divided first and second true to type aggregate	2	12	6			
Third winter test	1	1	0			
				7	7	0
E. Chester—						
First winter test	3	3	0			
Monthly prizes—April, May	1	1	0			
				4	4	0
Mrs. J. R. D. Munro, second single test				2	2	0
Miss M. Hinze, monthly prize, July				0	10	6
C. Porter do. August				0	10	6
W. R. Crust do. January				0	10	6
Mrs. Bradburne do. February				0	10	6
J. R. Wilson do. March				0	10	6

HEAVY BREEDS.

R. Burns—						
First general aggregate	4	4	0			
First winter test	3	3	0			
First and second single test	5	5	0			
Monthly prizes—Oct., Nov., Dec., Jan., March	2	12	6			
				15	4	6
A. E. Walters—						
Second general aggregate	3	3	0			
First true to type aggregate	3	3	0			
Second winter test	2	2	0			
Monthly prizes—April, Aug. (half)	0	15	9			
				9	3	9
W. G. Hansen—						
Third general aggregate	2	2	0			
Second true to type aggregate	2	2	0			
				4	4	0
E. A. Smith—						
Third true to type aggregate	1	1	0			
Monthly prizes—Aug. (half), Sept., Feb.	1	6	3			
				2	7	3
W. Smith, third winter test				1	1	0
Mars Poultry Farm, third single test				1	1	0
F. A. Claussen, monthly prize, May				0	10	6
E. F. Dennis do. June				0	10	6
E. Morris do. July				0	10	6
Total Prize Money				£69	6	0

Competitors.	Breed.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	Total.
LIGHT BREEDS.														
E. Chester ..	W. Leghorns	118	121	122	129	149	153	155	139	154	144	130	138	1,652
G. Chester ..	ditto ..	104	91	74	128	137	145	147	141	115	123	103	78	1,386
W. Becker ..	ditto ..	91	119	97	117	131	121	139	120	122	99	102	107	1,366
*G. H. Turner ..	ditto ..	73	103	127	128	132	142	133	120	111	100	98	99	1,366
*J. M. Manson ..	ditto ..	5	71	137	143	127	159	161	138	137	71	95	104	1,348
W. R. Crust ..	ditto ..	104	83	92	124	128	133	132	127	127	122	92	79	1,343
Oakland Poultry Farm	ditto ..	75	109	104	110	116	133	142	136	135	116	94	73	1,343
T. Taylor ..	ditto ..	79	83	97	110	128	124	140	123	124	103	97	108	1,316
F. W. Leney ..	ditto ..	44	105	100	142	143	140	140	128	125	97	73	67	1,304
D. Fulton ..	ditto ..	68	39	90	125	137	138	135	122	128	109	107	103	1,301
Kelvin Poultry Farm	ditto ..	17	70	120	133	138	141	149	141	109	110	89	78	1,295
*J. R. Wilson ..	ditto ..	108	60	85	116	117	126	132	125	130	90	76	112	1,277
*A. T. Coomber ..	ditto ..	50	76	101	114	129	130	139	135	127	89	89	79	1,258
Chris. Porter ..	ditto ..	72	69	102	143	145	140	141	97	87	80	75	102	1,251
T. A. Pettigrove, Vic.	ditto ..	64	106	96	123	126	140	127	114	112	81	75	84	1,248
*J. Zahl ..	ditto ..	72	90	104	111	111	135	135	122	113	70	80	88	1,231
Moritz Bros., S.A.	ditto ..	16	94	133	136	135	134	118	117	105	73	71	75	1,207
J. G. Richter ..	ditto ..	63	63	98	120	120	134	124	94	110	106	87	58	1,186
T. B. Hawkins ..	ditto ..	86	86	75	114	126	113	116	104	105	88	90	77	1,180
*Dixie Egg Plant ..	ditto ..	12	88	90	118	106	127	147	131	116	70	66	107	1,178
C. Knoblauch ..	ditto ..	44	89	101	97	126	124	98	89	123	94	102	91	1,178
Mrs. S. J. Sear ..	ditto ..	65	24	25	110	132	138	139	121	126	87	101	96	1,164
*Mrs. J. R. D. Munro	ditto ..	30	88	88	113	128	132	137	119	118	72	76	63	1,164
Quinn's Post Poultry Farm	ditto ..	54	33	111	139	133	148	127	109	105	83	69	53	1,164
Mrs. W. D. Bradburne, N.S.W.	ditto ..	67	40	58	98	138	129	126	121	122	77	112	69	1,157
C. H. Singer ..	ditto ..	59	38	33	93	121	131	136	128	127	75	109	106	1,156
J. L. Newton ..	ditto ..	30	35	101	115	127	123	141	131	110	92	83	66	1,154
A. Shilling ..	ditto ..	60	35	107	117	140	140	136	117	92	60	72	66	1,142
J. Holmes ..	ditto ..	19	33	82	114	125	128	135	122	125	105	77	67	1,132
L. G. Innes ..	ditto ..	37	34	80	116	126	131	129	106	107	98	81	87	1,130
*A. H. Padman, S.A.	ditto ..	97	80	93	75	111	123	131	115	102	79	64	54	1,124
A. W. Bailey ..	ditto ..	75	82	92	110	106	114	107	105	110	77	68	75	1,121
Mars Poultry Farm ..	ditto ..	69	78	75	127	122	110	111	108	103	76	65	49	1,093
C. P. Buchanan ..	ditto ..	32	28	71	85	120	135	137	133	120	69	89	62	1,081
S. C. Chapman ..	B. Leghorns	16	22	82	86	140	141	139	118	110	81	85	59	1,079

F. Clayton, N.S.W.	..	38	58	73	116	124	126	128	112	125	69	53	57	1,079
E. Cross	..	76	45	36	87	134	137	119	115	128	89	64	46	1,076
*T. Fanning	..	57	28	82	99	128	142	143	126	103	53	38	75	1,074
G. J. White	..	6	27	95	118	126	127	134	114	126	85	79	37	1,074
E. A. Smith	..	23	33	58	106	124	127	123	119	121	82	80	73	1,069
Miss M. Hinze	..	13	60	80	146	101	103	88	112	119	85	80	75	1,062
J. Ferguson	..	9	35	70	94	127	135	130	122	119	72	72	74	1,059
R. Holmes	..	76	74	60	110	110	120	117	109	81	55	65	77	1,054
G. Howard	..	..	34	90	121	137	140	131	107	88	55	65	78	1,046
Mrs. J. Carruthers	..	59	32	35	114	124	117	107	100	113	84	70	79	1,034
G. Williams	..	58	51	76	95	122	122	116	98	108	62	74	46	1,028
*A. E. Walters	..	..	30	103	123	116	124	120	118	102	75	45	48	1,004
*Dr. E. C. Jennings	..	12	31	56	91	99	121	135	115	108	91	76	62	997
*C. C. Dennis	..	1	65	94	115	103	109	110	102	86	37	..	..	822

HEAVY BREDS.

*R. Burns	..	76	91	116	161	151	149	140	143	132	113	78	120	1,470
*Mars Poultry Farm	..	54	81	113	138	140	145	145	129	138	113	112	120	1,428
W. Smith	..	80	79	90	156	142	149	130	115	110	63	90	99	1,303
A. E. Walters	..	81	77	93	157	156	133	117	103	119	65	86	90	1,277
*E. F. Dennis	..	..	56	120	151	144	139	141	106	114	87	78	74	1,217
W. G. Hanson	..	39	77	95	147	128	147	122	106	98	94	72	65	1,183
*E. A. Smith	..	1	10	45	152	156	151	131	139	112	82	92	95	1,166
F. A. Claussen	..	76	101	68	142	133	110	106	105	99	80	80	61	1,161
D. Kenway	..	64	57	92	114	128	102	111	105	102	76	89	98	1,138
Mrs. J. H. Jobling, N.S.W.	..	26	45	65	143	136	129	138	115	99	97	75	59	1,130
H. Jobling, N.S.W.	..	74	66	52	111	119	116	116	114	110	88	68	70	1,104
C. B. Bertelsmeier, S.A.	..	11	21	58	138	129	142	101	108	110	90	80	94	1,082
Cowan Bros., N.S.W.	..	40	60	90	133	132	124	105	87	94	72	62	79	1,078
P. C. McDonnell, N.S.W.	..	38	53	97	131	124	118	110	98	85	80	81	58	1,073
King and Watson, N.S.W.	..	6	32	109	121	112	125	115	95	106	90	71	81	1,063
J. M. Manson	..	..	11	29	134	146	132	113	103	115	79	69	90	1,021
*Oakland Poultry Farm	..	25	39	38	128	145	129	117	96	94	85	63	42	1,001
R. Burns	..	..	3	80	141	134	120	99	107	106	81	67	63	1,001
*Miss M. Hinze	..	..	1	32	141	141	147	125	131	97	92	50	30	987
E. Morris	..	13	..	27	173	140	121	113	93	106	65	39	86	976
C. C. Dennis	..	..	24	74	109	116	126	94	98	88	75	83	88	975
*Kelvin Poultry Farm	..	8	34	28	120	134	139	94	84	101	66	78	48	934
*F. W. Loney	..	10	28	42	78	123	122	81	90	79	50	45	30	778
F. Clayton, N.S.W.	..	14	80	68	79	116	85	76	57	58	49	45	42	769
Totals..	..	3,239	4,194	5,972	8,820	9,375	9,505	9,122	8,313	8,091	6,092	5,657	5,488	83,869

* In the General Returns indicates that the pen is taking part in the Single Hen Test.



MR. W. BECKER'S PEN OF WHITE LEGHORNS.



MR. W. R. CRUST'S PEN OF WHITE LEGHORNS.



MR. E. CHESTER'S PEN OF WHITE LEGHORNS. (Eggs laid, 1,661; average weight, $1\frac{7}{8}$ oz.)

RETURN FROM SINGLE TEST PENS.
Light Breeds.

	A.	B.	C.	D.	E.	F.	Totals.
G. H. Turner	178	210	248	262	221	247	1,366
J. M. Manson	229	243	186	178	240	272	1,348
J. R. Wilson	229	203	193	219	209	224	1,277
A. T. Coomber	206	160	250	237	205	200	1,258
J. Zahl	243	110	247	149	247	235	1,231
Dixie Egg Plant	195	217	178	239	127	222	1,178
Mrs. Munro	264	197	144	153	162	244	1,164
A. W. Bailey	36	213	229	227	227	189	1,121
T. Fanning	157	209	187	146	157	218	1,074
A. E. Walters	120	130	182	222	176	174	1,004
Dr. E. C. Jennings	129	118	207	189	220	134	997
C. C. Dennis	176	89	77	154	162	164	822

Heavy Breeds.

R. Burns	204	195	267	193	277	334	1,470
Mars Poultry Farm	220	255	232	234	249	238	1,428
E. F. Dennis	233	231	201	277	239	36	1,217
E. A. Smith	193	201	171	218	196	187	1,166
Oakland Poultry Farm	220	136	144	124	233	144	1,001
Miss M. Hinze	161	136	130	181	185	194	987
Kelvin Poultry Farm	137	143	160	211	106	177	934
F. W. Leney	133	165	118	115	114	133	778

BALANCE-SHEET.

RECEIPTS.

	Dozen.	£	s.	d.	£	s.	d.
Entry fees	..	..	..	..	83	0	0
Sales eggs—							
Defence Department	3,595 $\frac{1}{2}$	201	8	3			
Barnes and Co.	735 $\frac{1}{2}$	25	19	1			
Orient S.S. Co.	158 $\frac{1}{2}$	9	4	11			
Sundry Sales	151 $\frac{1}{4}$	8	1	1			
College Dining-hall	2,348 $\frac{1}{4}$	136	18	1			
					381	11	5
Total	..	..	..	..	464	11	6

EXPENDITURE.

	Bushels.	£	s.	d.	£	s.	d.
Prize Money	..	..	..	..	69	6	0
Food—							
Wheat	296	63	17	8			
Maize	42	6	10	0			
Hulled Oats	15	5	9	9			
Skinless Barley	9	5	14	0			
Pollard	420	28	17	2			
Bran	196	9	10	1			
	Cwt.						
Oilcake	4	2	3	5			
Desiccated Meat	2	1	4	0			
Bonemeal	11 $\frac{1}{2}$	0	19	3			
Dried Blood	4 $\frac{1}{2}$	3	4	0			
Green Lucerne, valued at	..	2	0	0			
Soup Meat, valued at	..	3	0	0			
					132	9	4
Balance	..	..	..	..	262	16	1
Total	..	..	..	..	£464	11	5

CUTHBERT POTTS,
Principal.

Apiculture.

THE COTTON PLANT AS A FACTOR IN BEE-FARMING.

Writing on this subject in the "Apicultural Journal," Mr. Daniel Jones says:—"A hitherto unsuspected addition to the bee forage of the State has recently—through the medium of an American journal, in directing attention to the merits of the cotton shrub for this use—come into prominence. The renowned American authority quoted avers that hardly in an experience of over twenty years has the cotton honey harvest failed him. From reports gathered we learn that the American beekeeper regards this source of honey with greatest appreciation, and depends largely on this for his profits. The old cotton-growers, who in former years had an intimate acquaintance with this industry when it was the biggest farm crop produced in this State, appear to have completely overlooked this source of revenue, inasmuch as no notice is known to have been taken of this fact, although there were many beekeepers at that time engaged in the business. Much as the American appreciates the value of cotton as a source of profit, here in Queensland we have incomparable advantages compared with our American cousins. In the United States cotton belt the shrub blooms for about four to five months in the season; here it will blossom for at least seven months, and carry a much larger number of flowers than is the case in American plantations.

"Judging from the character of our Mascot types of cotton, which bear a very large blossom, and to all appearance contain a larger proportion of pollen than do the herbaceous varieties, we, in this way, should reap an additional advantage.

"Growing the shrub as a perennial plant is not much understood in the cotton belt of the United States, for the reason that frost terminates its growth; which is not always the case in Queensland. I have at present, in my yard at Petrie terrace, a shrub which has been now eleven years bearing, and is furnishing a honey source which would make a beekeeper's eyes glisten. An ordinary plant of the annual type would in a season hardly produce over fifty blossoms. With the perennial types hundreds of blooms will open, from which (as in evidence daily) the busy bee makes good use of her opportunity.

"As a new factor in land settlement this combination of bee-farming, in conjunction with cotton-growing, should have close attention from all interested in either soldier or civilian settlement.

"Cotton is almost an unfailing source of bloom, despite drought or other adverse circumstances. I know of no plant so hardy and so adaptable to our climatic conditions. No settler need fear failure if he goes on a farm where he can raise cotton, honey, and sheep.

"The beekeeper who elects to grow the cotton plant will find it a business not nearly so hazardous as often described.

"Leaving out of question the value of the plant as a bee pasture, which the American authorities evidently appreciate as an auxiliary to ordinary beekeeping, it merits some consideration.

"There are, no doubt, some periods of dearth in bee-farming as in all other rural pursuits, which must be provided for. If the apiarist has a few acres of cotton in his neighbourhood, be they his own or not, some considerable advantage thus accrues. If, however, the plants belong to the bee-man, and his leisure from bee work is assured, and time hangs, it will be a pleasant change to fix up the picking-bag and try his prentice hand on the job. For the first few days he will have sore back and resent the work, but on calculating the compensation in money value he will then be more reconciled, particularly if at the time when his bees are not coining money for him. It costs but a half-penny per pound or less to grow a pound of cotton in seed, and this past season growers have realised 3½d.,* so if a picker

* In the boom days, from 1866 to 1873, when the exports of cotton from Queensland were represented by millions of pounds, farmers put large portions of their land under cotton, for which the highest price paid locally was 3d. per lb. [Ed. "Q.A.J."]

gathers anything from 80 to 100 lb. a day, his added wealth stands at from 20s. to 25s. for his day's task. And as his plants will remain in bearing for several years, the annual cost of resowing is obviated, only the small cost of the usual attention in clearing weeds requiring to be met for two or three months of the season, as the plants soon grow sufficiently high and bushy to smother weed growth.

"This is not to be a writing on cotton culture, so I must leave it at this, trusting that as the subject is ventilated in your columns, beekeepers will find some advantage in diversifying their rural work in the direction indicated.

"The best sowing period in the South is from September to November. It can, however, be sown during December in localities not subject to early frost.

"Plants should be spaced 3 feet 6 inches to 4 feet apart in straight lines, so that cross cultivation can be carried on expeditiously.

"In rich soil two plants may be left growing together, otherwise one plant alone is advised. The maturing period from seed to flower of herbaceous plants of the Upland variety is 80 to 90 days; Sea Island, 100 to 110 days. From flower to maturity, Upland sorts, 70 to 80 days; Sea Island, 80 days. Mean daily temperature best adapted to the cotton shrub is 60 to 78 degrees. An increasing daily temperature is necessary for producing the best quality fibre.

"Our Mascot varieties, now long acclimated in Queensland, are very hardy, and have a good-class fibre. However, they are slow in maturing their crop, hence this factor should be taken into account if sowing this type. Generally speaking, this variety will not give a satisfactory crop under twelve months, and in cases even longer, while the herbaceous sorts crop in four months or so after planting."

COTTON AS A HONEY PRODUCER.

Considering the increased attention that is now being paid to the question of cotton-growing, we ("Queensland Apicultural Journal") have been anxious to know whether this plant might be claimed as another source of revenue to the Queensland honey-producer. Our minds have now been set at rest by the perusal of a recent editorial on the subject in the "Beekeepers' Item," a bright little journal, published in Texas, U.S.A., by Louis H. Scholl, one of America's most practical honey-producers. The article which we quote here should give us a heightened appreciation of the cotton bush—a plant that produces raiment to wear, the finest of food to eat, and one of the essentials in winning the war—guncotton.

"Cotton is one of the most remarkable honey plants. On account of the drought its growth was very much retarded throughout a big part of the cotton belt. Much of it not larger than 6 inches in height, regular "humble bee cotton," as it is often called then. After yielding a little honey in the latter part of June and in July, the drought became so severe that it stopped growing altogether, and although almost destroyed in many instances late rains revived it to such an extent that we succeeded in getting a nice cotton honey crop from it before the freezes killed it in October. This was the first year during our twenty-five years' beekeeping experience that this source did not yield a bountiful harvest of honey."

OF INTEREST TO VITICULTURISTS.

On another page of this issue of the Journal will be found amongst the "Departmental Announcements" a notice that cuttings of hybrid grape-vine stocks may be obtained on application to the Under Secretary, Department of Agriculture and Stock. These vines, it should be noted, are not to be grown for fruit, but for purposes of grafting on to other varieties of grapes. The value of these cuttings is that they are practically immune from the attacks of the phylloxera vastatrix or vine louse, which appeared once some years ago in the East Moreton District, and threatened to spread to other portions of the State. Happily the Department took prompt measures to avert such a calamity, and with such success that nothing has since been heard of the terrible pest. It does not, however, follow that our vineyards will never suffer from this cause again, but to be forearmed against such a possibility, the planting of resistant vines is earnestly advised, and such are those which are now to a limited extent available to vigneron and others who have small areas of grape-vines.

Botany.

RECORDS OF A FEW ALIEN PLANTS (*).

By C. T. WHITE, Government Botanist.

Cajanus indicus, Linn. Pigeon Pea. (Order Leguminosae.)

Met with as a stray along the Goondi road, Innisfail. *H. G. Ladbrook*. Native of India.

Foeniculum vulgare, Gaertn. Fennel. (Order Umbelliferae.)

Met with as a stray from garden culture, Blackall Range, April, 1918. Native of Central and Southern Europe and Western Asia.

Artemisia scoparia, Woldst. and Kit. (Order Compositae.)

Met with as a stray from garden culture, Blackall Range, April, 1918. A native of Eastern Europe, Western Asia, and India.

Ipomaea coccinea, Linn. (Order Convolvulaceae.)

Mr. Power, Warden, Cooktown, in sending specimens of this plant to the Deputy Chief Inspector of Stock, Townsville, wrote, 29/6/1916—

“A few days ago, when visiting the Bloomfield River, I was informed that several horses of different owners had died lately. Inquiry elicited the idea that death was most probably caused by the horses eating a small vine or creeper commonly known as ‘Star of Bethlehem,’† and grown in flower gardens. It luxuriates in this locality and covers vast areas. The horses are apparently very fond of it; they begin at the tender tops and gradually eat the vine to the tough fibrous end. This causes a stoppage in the bowels, and soon prevents the animal passing any dung, and causes great pain and straining. Mr. Pierce told me that he lost an entire, the horse, after great straining, passing a large piece of stuff about 15 inches or more in length, and shaped like a sausage. He was given about half a pint of castor oil, but died during the night. Mr. Pierce opened the horse and found the paunch filled with a mass of fibrous matter. I am sending you a sample of the creeper, which is no doubt spreading to a very great extent in that locality. It does not affect cattle in the same way, probably because they chew the cud.”

Apart from other interest, the record is interesting as, though specimens have been sent in from time to time from different localities, I have never previously seen or heard of the plant spreading to any extent. It is a native of tropical America.

Physalis ixocarpa, Brot. Purple Gooseberry. (Order Solanaceae.)

Annual, stem at first erect, later widely spreading and much branched, glabrous or the young shoots slightly hairy. Leaves 1 to 2½ inches long, ovate, margins entire or sinuately dentate. Peduncles (flower-stalks) short. Calyx slightly pubescent, lobes shorter than the tube. Corolla yellow with a purple throat, ½ to ¾ inches across. Fruiting calyx round or round-ovoid, sometimes purple-veined, filled by the purple berry which usually bursts it. Berry purple when ripe, and of an average size of 1 inch in diameter. A native of tropical America, cultivated for the sake of its edible fruits; it has established itself as a common naturalised weed in the Killarney district and probably in other localities.

* See also “Queensland Agric. Journ.,” Vol. VIII., n.s., pp. 269-270, 1917.

† *Ipomaea coccinea* is not the plant known as “Star of Bethlehem,” which is *Ipomaea quamoclit*, but is very closely related to it; and a hybrid between the two species, known as “American Jasmine,” is not an uncommon plant in gardens.

Entomology.

PREDACEOUS ENEMIES OF THE SUGAR-CANE AND THEIR PARASITES.

The General Superintendent of Sugar Experiment Stations has received the following report from the Entomologists to the Bureau, Dr. J. F. Illingworth and Mr. Edmund Jarvis:—

“Investigations regarding the influence of cultural methods on the cane-grub problem look promising on the whole, although at present it is rather early to make definite statements in this connection. Such operations, however, as scarifying or ploughing deeply enough to destroy egg-chambers of the beetle and to occasion mechanical injuries to the young grubs or expose them to great solar heat and to the attacks of birds and other enemies cannot fail to be beneficial. We are inclined to favour an adoption, whenever practicable, of the following cultural measures:—

- (1) Cultivation of the cane during summer weather followed immediately by ploughing such areas.
- (2) Late planting and persistent cultivation during the period of oviposition and a few weeks subsequent to the disappearance of the beetles.
- (3) Ploughing or fallowing land in December.
- (4) Having the ground densely covered with Mauritius beans during the flight of the beetles.

“In support of the above-mentioned procedures it may be stated that certain areas under cane at Greenhills and elsewhere which were planted in December appear flourishing at present, while adjoining land planted earlier is already badly grub eaten.

PREDACEOUS ENEMIES.

“Since reporting last month a little data has been obtained respecting the habits of bandicoots. In the intestines of a specimen recently dissected at the laboratory the skins of several cane-grubs (*L. albohirtum*) were found, together with a wire-worm and many chitinous fragments of coleopterous and other insects. Although this animal is credited with being omnivorous, no vegetable remains were apparent, and judging by the structure of the mouth and its forty-eight sharp teeth, it certainly seems improbable that bandicoots, as some assert, damage cane stools by gnawing the roots and young stalks.

“The small animal alluded to in previous reports as preying on grubs of *L. frenchi* is probably a species of *Phascologale*, it having been described to us as being about the size of a small rat, but with head and mouth resembling those of a bandicoot. We hope to trap and cage some specimens of this little marsupial with a view to observing its habits and dietary.

PARASITISM.

“Since reporting last month, information received from the Queensland Museum renders it necessary to state that the scientific name of our common digger-wasp, hitherto known to Australian entomologists as *Dielis formosa*, has recently been changed by R. E. Turner, of the British Museum, to *Campsomeris tasmaniensis*, Sauss. It appears that the true *formosa*, which occurs at Kuranda and elsewhere and is not unlike *C. tasmaniensis* in form and general colouration, does not range south of Cairns. We have not met with this species at Gordonvale. In the absence of literature relating to the question, we have naturally followed the lead of other scientists in supposing our familiar digger-wasp to be identical with *Scolia (Dielis) formosa* of Guérin.

“During the past month attention has been given to the rearing of parasites in order to obtain scientific data with regard to their life history and economy, and to determine the best method of breeding extensively and handling them in large numbers.

“This branch of research work has been very successful, and in the event of parasitic insects being introduced into Queensland from other countries in the near future to cope with our cane grubs we are now in a position to make the best use of such material.

"The following brief account of the mode of wasp-propagation practised at Meringa may be of interest to growers:—

"Digger parasites were confined separately in metal cages holding about 15 cubic inches of soil, the grubs with attached eggs being removed morning and evening and placed into cells formed in moist compacted earth that had been previously pressed into shallow wooden trays. A convenient size of tray was found to be 16 by 13 inches, which allowed room for sixty cells, and when full they were stacked up so that the bottom of each tray acted as a roof for that below, and left just enough space to allow the larvæ to spin their cocoons. At the present time (12th April) about 750 specimens of egg, larval, and pupal stages of our two principal digger-wasps may be seen at Meringa Experiment Station.

"We wish to emphasise the fact that the cane-grubs victimised by both *Campomeris radula* and *tasmaniensis* are chiefly those of the notorious grey-back beetle. Additional hosts affected by these parasites include *Anoplognathus boisduvalli*, *Lepidiota frenchi*, *rothei*, and *caudata*.

"The hundreds of grubs victimised at the insectary during this month (March) are third stage *albohirtum* (mealy-back cane-beetle).

GRUBS UNDER BLADY-GRASS.

"Recent data obtained in the field at Meringa indicates that stage III. larvæ of *Lepidiota frenchi* are still feeding in virgin soil overgrown with blady-grass and other cereals. Grubs collected hastily from 120 chains of plough-furrows, 4 to 6 inches deep, on clay loam land of the above nature, yielded 107 specimens of third stage *albohirtum*, 128 of the same stage *frenchi*, and a few larvæ of *L. rothei* and other scarabæids of minor importance. The grubs of *frenchi* as a whole are still feeding, but will shortly travel deeper into the ground and form pupil chambers. It is interesting to note that these grubs were derived from eggs deposited in December, 1916, and have therefore been more or less injurious during the past sixteen months."

WHAT AUSTRALIA OWES TO GREAT BRITAIN.

Mr. Denison Miller, Governor of the Commonwealth Bank, makes the following statement:—

"During this season about £100,000,000 will have been distributed to primary producers. It has been possible to market these products only because of arrangements made with the British Government through the Commonwealth Bank. The situation, particularly in regard to prices, would have been very different but for the generosity of the British Government. In fact, it is doubtful whether a market would have been obtainable at all.

"To give a clear understanding of the position, and show the tremendous extent of the benefit Australia has derived from this arrangement, Mr. Denison Miller has given the following particulars:—

1915-16 Wheat Harvest.—British Government advanced in anticipation of shipments, £11,000,000.

1916-17 Wheat Harvest.—British Government purchased 3,500,000 tons of wheat and paid for it before delivery—£26,000,000.

1916-17 Wool Clip.—British Government purchased the greater part of the clip and paid for it before shipment—£25,000,000.

1917-18 Wool Clip.—British Government has purchased the whole of it and is paying before shipment the estimated value of the wool and skins—£45,000,000.

Meat and Rabbits.—British Government has for the past two years purchased the exportable surplus of meat and rabbits, estimated at £7,500,000 per annum, and pays for it immediately on shipment—£15,000,000.

Butter and Cheese.—This season's exportable surplus has been purchased by the British Government, and the producers are being paid immediately it is delivered in store and before shipment—£4,000,000.

"In addition there are many other products which the British Government has purchased, including metals and jams, of which detail figures cannot be given, and Britain in her generosity has paid for a very large quantity of them before they are even shipped from Australia. This, too, in spite of the fact that because of the shipping shortage long delays are bound to occur before delivery can be made.

"Though these figures are incomplete they convey some idea of the extent to which the prosperity of Australia is attributable to the liberality of Great Britain. A sense of obligation cannot but be deeply felt. Every class of the community is laid under a debt of gratitude."

General Notes.

THE COTTON PLANT FROM SEED TO MATURITY.

Uplands, after sowing the seed, will flower in from 80 to 90 days. From flowering to maturity, when picking may commence, 70 to 80 days. Sea Island cotton will flower, after sowing, in from 100 to 110 days, and from flowering to maturity, about 80 days. As a rule, cotton is a crop which may be gathered in from five to six months.

CURING MEAT.

Recipes for curing meat in hot weather are of special interest, and the ones given here have been tried. Meat for curing must be thoroughly cooled, because if the surface of meat comes in contact with salt before all the animal heat is removed, it will have a tendency to shrink the muscles and form a coating on the outside which will not allow the generating gases to escape. Meat should never be frozen when salted, because the brine will not penetrate uniformly, and uneven curing will result. Hams and sides should be trimmed smoothly, care being taken to expose as little lean meat as possible. The meat may be placed in earthenware jars or oak barrels with wooden hoops, since iron hoops will rust.

Good brine for brine-curing can be made from 10 lb. of salt, 2 lb. of sugar or molasses, and 4 gallons of water to 100 lb. of meat. It is a good precaution to boil and skim the mixture. Two or three ounces of saltpetre may be added to preserve the natural colour of the meat, but is harmful to the health even if used in small quantities. Brine does not easily freeze, but meat cures more rapidly if it does not become too cold. The bacon will cure in from twenty-two to thirty days, while the heavier hams need from forty to sixty days. Freshen cured meat in lukewarm water for six hours, then dry and smoke.

For dry curing, make a mixture of clean fine salt, 40 lb.; white or brown sugar, 10 lb.; white or black pepper, 4 lb.; red pepper, $\frac{1}{2}$ lb. This will make enough cure for about 1,000 lb. of pork. If saltpetre is desired, use 2 lb. in the above mixture. Rub each piece of meat thoroughly with the cure, working it in well around the bones of hams and shoulders. Pack with skin down in a box in a cool, airy place, not in direct sunlight nor in a damp musty cellar. After four or five days overhaul the meat, rub thoroughly with the cure, and repack; repeat this in about a week. Hams and shoulders should remain in the cure from one and one-half to two days per lb. weight of piece; the latter time is safer for meat that is to be kept during the summer. Bacon should be in the cure a shorter time. Ten days will give a very nice mild cure to a 6 or 8 lb. piece.

Any of the mixtures which give good results in curing pork can be used satisfactorily for beef, but beef should not be allowed to remain in the brine or mixture quite so long. Corned beef is best when it has been in the cure about ten days.

Here is the "Farm Journal" recipe for dried beef, used again and again by many of our readers. Try it by all means:—Get the tender side of the round out of a good fat beef. For every 20 lb. of beef take 1 pint of salt, a teaspoonful of saltpetre, and $\frac{1}{4}$ lb. of brown sugar. Mix these well, rolling out any lumps; divide into three equal parts, and rub well into the beef for three successive days. Turn beef daily in the liquor it will make. It should not make much, but what there is rub into and pile on the beef. Rub a little extra salt into the hole cut for the string to hang it by. At the end of a week hang in a dry, rather warm place, till it stops dripping, then in a cooler, dry place. Do not smoke it; it spoils the flavour.

Pickled and cured meats are smoked to aid in their preservation. The smoke seals up the pores, acts as a vermifuge, aids in drying, and adds flavour to the product. The smoke-house should be 6 to 8 feet high for ordinary farm use. Small openings under the eaves, or a chimney on the roof, will provide the essential free circulation. Brick houses are best, but large drygoods boxes and even barrels may be made to serve as smoke-houses where only small amounts of meat are to be smoked.

Sometimes there is trouble in keeping meat after it has been cured or smoked. It should be stored in a dry, cool, and well-ventilated place. If allowed to hang up unprotected it is almost certain to become infested with skippers and be blown with flies. The most satisfactory way to handle the meat is to wrap it up in paper and then enclose in strong muslin sacks, tied tightly at the tops.—"Farm Journal of the U.S.A."

GOOD IDEA FOR A NOSE-BAG.

The "New Zealand Farmer" supplies the following excellent idea for a nose-bag, which should prove of great comfort to horses whose mid-day feed is supplied in a suffocating bag:—

Ever consider the discomforts of a horse compelled to feed with his breathing apparatus buried in a nose-bag full of dusty chaff? asks "Murkah" in the "Bulletin." They must be considerable, especially in hot weather. The other day I saw an idea for giving Dobbin his mid-day bite so superior to the nose-bag that, after the publication of particulars in this paragraph, I confidently expect to see a revolution in horse-feeding methods. Here's the recipe: Get a piece of bagging 2 feet 6 inches or so square. Sew in four pieces of wood round the edges. To one end of two of them attach short straps, and, to the other ends, longer straps. Buckle the short straps to the collar or hames at the height the feed is required, and the longer ones (long enough to let the contraption hang out level) higher up on the same piece of harness. The pieces of wood hold the bag out, and the result is a small feed-trough from which Nugget can extract the last oat without nearly breaking his neck and half-suffocating himself in the process. The driver of the team was enthusiastic about the idea, remarking that as well as being kinder to the horse it was handier in every way than the nose-bag.

TO REPAIR OLD TYRES.

In every garage there is generally a number of worn-out tyres. A strong, serviceable inner patch may be made by using a portion of one of these disused covers. Cut, say, 12 in. from a similar sized old tyre, and remove the lip as in Fig. 1.



FIG. 1.

Feather at both ends for 1 in., so that the inner tube when inflated will not press on any sharp edge. Procure six bolts and nuts 1 in. x 5-16th in., and six washers to fit same, not less than $\frac{1}{2}$ in., but $\frac{3}{4}$ in. would be better. With a brace and bit, or drill, bore hole (B in Fig. 2) from the outside, first taking care that the patch fits

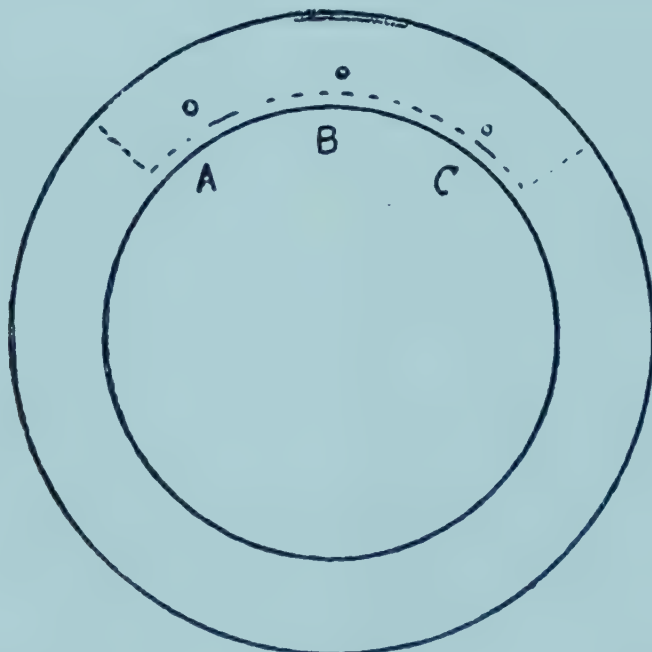


FIG. 2.

as near as you can press it to the inside of the tyre. Pass the bolt, which must have rounded end, through the patch and tyre from the outside, then put on washer and screw the nut on tightly. Proceed in similar way with holes (A and C, Fig. 2). Turn tyre round and proceed in similar way with the other side. When all nuts have been screwed as tight as they will go, cut off ends of bolts with a hack saw or file. Old tyres treated this way have been used for over 1,000 miles.

THE "OXLEY FERTILISER."

Owing to an error in the Advertising Office, the change of prices in Messrs. Foggitt, Jones, and Co.'s advertisement in the May issue of the "Journal" was not noted. The prices fixed for their lines should have read as follow:—"Price per ton, £9. Less than ton lots, 9s. 6d. per cwt." We trust that our readers will accept this explanation, which naturally absolves Messrs. Foggitt, Jones, and Co. from all blame.

EXCAVATED SILOS.

Mr. B. Jewitt, Buderim, writes:—

Re article on silos in the "Agricultural Journal," of April, 1917, this will probably suffice; but will it suffice to induce some of our farmers to rise to the wisdom of our savage ancestors and build silos? No, we need not build silos, but excavate the soil from the face or brow of a hill to any size you like, only it is considerably wider at the top than at the bottom, so that the greenstuff will press at the sides as well as at the middle, and thereby we avoid musty ensilage. It must be covered with some waterproof material.

SOCIETIES, SHOW DATES, ETC.

Atherton.—Atherton Tableland Agricultural Society: Show dates, 18th and 19th September. W. Morris, secretary.

Bowen.—Bowen Pastoral, Agricultural, and Mining Association: Show dates, 29th and 30th August.

Mackay.—Sarina Branch of the Pioneer River Farmers and Graziers' Association. Secretary, W. S. O'Grady.

North Pine.—Pine Rivers Agricultural, Horticultural, and Industrial Association Show (at Lawnton), 21st and 22nd June.

Wellington Point Agricultural, Horticultural, and Industrial Association.—E. Beekley, secretary.

ALTERATION OF SHOW DATES.

The dates of the Show of the Port Curtis Agricultural, Pastoral, and Mining Association have, in order to avoid clashing with other events, been altered from 11th, 12th, and 14th June, to 12th, 13th, and 14th June.

ABOUT MAIZE AND OATS—A WORD TO FARMERS.

The farmer who remembers his early difficulties, his struggle against adverse weather conditions, the trials, tribulations, and disappointments which met him at every turn, will feel the utmost sympathy for the returned soldiers who are being placed on the land. He will know something of the obstacles which these men must overcome, and with his inborn generosity he will be quite ready and willing to lend a helping hand to those who, after fighting in far distant lands, have come back to carve out new homes for themselves and their families in the land of their birth or adoption.

An excellent opportunity now presents itself for growers of maize, oats, or other cereals, which are utilised as feed for poultry to assist. The Poultry Subcommittee of the Queensland Land Settlement Committee has just established a number of settlements for returned soldiers, who are anxious to go in for poultry-raising. Many of these men have already taken over their holdings, which are being stocked with young poultry. The resources of these soldier poultry farmers are naturally very limited, and it will be of very great assistance if farmers and others will make contributions in the form of grain suitable for young poultry. Farmers can help their country and the saviours of their country in a practical way by putting aside a few bags of maize or oats or other grain to be handed to the soldier poultry-raisers.

Secretaries of various farmers' organisations might also take the matter up and organise contributions amongst the members of their organisations.

Those willing to assist should communicate with the Secretary, Land Settlement Committee, Lands Department, Brisbane, when arrangements will be made to take delivery of all contributions of grain and distribute it amongst the various poultry farmers.

TOBACCO SEED.

The Department of Agriculture and Stock has just received from America a supply of tobacco seed (pipe and cigar varieties). These varieties comprise Yellow Pryor (pipe and cigarette), Sumatra (cigar wrapper), Zimmer Spanish (cigar), Improved White Stem Orinoco and Comstock (cigar).

Price, 2s. 6d. per oz., postage paid. Application and remittance should be forwarded to the Under Secretary for Agriculture, Brisbane.

POOK'S PATENT CHAFF BAGGER AND DUMPER.

One of the special features of the Sydney Show was a Pook's Patent Chaff Bagger and Dumper in full operation. Thousands of interested farmers witnessed the demonstration, and the comments made on it were very flattering to the patentee. It is a dumper with the faults left out. Mr. Pook had witnessed the unsatisfactory working of several machines, and decided to experiment to improve them. That he has been successful is clearly demonstrated by the number of testimonials from satisfied users. He started manufacturing at Forest Hill three years ago, but owing to the increased demand for machines it necessitated the removal of the plant to a more central position. He is now in commodious premises in South Brisbane, and a visit to the works shows a number of Queensland workmen using Queensland timber and castings, turning out machines as fast as possible to meet the large number of orders. One of the machine's special features is the feet, which partly revolve after each stroke, thus ensuring an even pressure on the bags at all times.

Anyone in need of a chaff bagger and dumper would have their time amply repaid by first seeing a "Pook" before purchasing any other machine.

MYSTERIOUS DISEASE IN STOCK.

"For a number of years, cattle have been dying on certain holdings in the Horton end of the district, from a mysterious disease. The Stock Inspector, Mr. H. W. Copeland, has lately held a *post-mortem* examination, with the result that the cause has been found to be parasitical gastritis, which is brought about by the infestation of small round worms that are invisible to the naked eye. The symptoms of the disease are the gradual wasting away of the animal, profuse scouring, and a watery gathering or dropsical swelling about the throat. There is also a general anæmic appearance, and eventually the animal becomes so weak that it dies. The animals affected are from twelve months to two years old. The Inspector advises a plentiful supply of block salt, and dosing them with a solution that can be had on application at the office of the Stock Inspector."

The above is an extract from the local paper. In mentioning block salt, Inspector Copeland evidently refers to "Leslie Salt Licks," which are known in the U.S.A. as "block" or "brick" salt because they are manufactured in the shape or form of a block or brick.

There is no other salt put up in the same convenient way. "Leslie" Salt Licks are fitted with loops for hanging to post, rail, or manger. They cannot absorb the germs and filth which are so common round the usual rock salt dump.

Graziers, pastoralists, dairymen, and horse owners will be interested to learn that Stock Inspectors are now recommending "Leslie" Salt Licks where cattle and sheep disease are prevalent.

Answers to Correspondents.

THE MANAGEMENT OF DUCKS.

Owing to pressure of space, our article on the Management of Ducks is unavoidably held over until next month.

WORK OF A SAW-GIN.

"COTTON-GROWER," Ipswich—

A good 50-saw gin will turn out from 1,000 to 1,500 lb. of lint per day of ten hours, in America. Working eight hours per day, as in this State, the output would be from 800 to 1,200 lb. per day. It would not pay to set up a ginnery on a 50-acre cotton farm. If a number of growers in the same district would plant large areas, say from 10 to 50 acres, they might co-operate to establish a ginnery, and so make it a paying concern.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR MAY, 1918.

Article.								MAY.
								Prices.
Bacon	...	...	...	...	...	...	lb.	9d. to 10d.
Barley	...	...	...	...	...	...	bush.	3s. 5d.
Bran	...	...	...	...	...	...	ton	£6 15s.
Broom Millet	...	...	...	...	...	...	"	£35 to £45
Butter (First Grade)	...	...	...	...	...	...	cwt.	128s. 6d.
Chaff, Mixed	...	...	...	...	...	...	ton	£3 10s. to £5
Chaff, Oaten (Imported)	...	...	...	...	...	...	"	£7 10s.
Chaff, Lucerne (Local)	...	...	...	...	...	...	"	£6 10s. to £7 10s.
Chaff, Wheaten	...	...	...	...	...	...	"	£1 to £5 10s.
Cheese	...	...	...	...	...	...	lb.	7½d. to 10½d.
Flour	...	...	...	...	...	...	ton	£12
Hams	...	...	...	...	...	...	lb.	1s. 3d. to 1s. 10d.
Hay, Oaten	...	...	...	...	...	...	ton	...
Hay, Lucerne	...	...	...	...	...	...	"	£5 to £5 6s.
Hay, Wheaten	...	...	...	...	...	...	"	£4 to £5 10s.
Honey	...	...	...	...	...	...	lb.	3½d. to 4d.
Maize	...	...	...	...	...	...	bush.	4s. to 4s. 6d.
Oats	...	...	...	...	...	...	"	4s. 6d.
Onions	...	...	...	...	...	...	ton	£8 10s. to £10
Peanuts	...	...	...	...	...	...	lb.	3½d. to 4d.
Pollard	...	...	...	...	...	...	ton	£7 5s.
Potatoes	...	...	...	...	...	...	"	£4 6s. to £7 15s.
Potatoes (Sweet)	...	...	...	...	...	...	"	£2 5s. to £3 10s.
Pumpkins (Cattle)	...	...	...	...	...	...	"	£3 5s. to £3 15s.
Eggs	...	...	...	...	...	...	doz.	1s. 10d. to 2s. 6d.
Fowls	...	...	...	...	...	...	per pair	3s. to 7s. 3d.
Ducks, English	...	...	...	...	...	...	"	2s. 9d. to 3s. 9d.
Ducks, Muscovy	...	...	...	...	...	...	"	5s. 6d. to 6s.
Geese	...	...	...	...	...	...	"	6s. to 6s. 6d.
Turkeys (Hens)	...	...	...	...	...	...	"	8s. to 9s. 6d.
Turkeys (Gobblers)	...	...	...	...	...	...	"	12s. 6d. to 20s.
Wheat (Milling)	...	...	...	...	...	...	bush.	3s. 9d. to 4s.

VEGETABLES—TURBOT STREET MARKETS.

Beans, per sugar-bag	...	...	...	...	...	...	6d. to 2s. 8d.
Beetroot, per sugar-bag	...	...	...	...	...	...	6d. to 9d.
Cabbages, per dozen	...	...	...	...	...	...	1s. to 4s. 6d.
Carrots, per sugar-bag	...	...	...	...	...	...	2s. 6d. to 5s.
Cauliflowers, per dozen	...	...	...	...	...	...	13s. to 17s. 6d.
Chokos, per case	...	...	...	...	...	...	1s. to 1s. 3d.
Cucumbers, per dozen	...	...	...	...	...	...	1s. to 1s. 6d.
Lettuce, per dozen	...	...	...	...	...	...	1s. to 1s. 6d.
Marrows, per dozen	...	...	...	...	...	...	2s. 6d. to 3s. 6d.
Parsnips, per dozen bundles	...	...	...	...	...	...	6d. to 1s.
Peas, per sugar-bag	...	...	...	...	...	...	6s. to 9s.
Sweet Potatoes, per sugar-bag	...	...	...	...	...	...	2s. 3d. to 3s.
Table Pumpkins, per dozen	...	...	...	...	...	...	6s. to 6s. 6d.
Tomatoes, per quarter-case	...	...	...	...	...	...	2s. to 4s. 6d.

SOUTHERN FRUIT MARKETS.

Article.						MAY.
						Prices.
Bananas (Queensland), per case ...	...	...	...	...	...	9s. to 15s.
Bananas (Tweed River), per bunch ...	...	...	...	...	...	10s. to 12s.
Bananas (Fiji), per case ...	...	...	...	...	...	20s. to 23s.
Bananas (G.M.), per case ...	...	...	...	...	...	20s. to 23s.
Custard Apples, per tray ...	...	...	...	...	...	...
Lemons (local), per bushel-case ...	...	...	...	...	...	...
Mangoes, per case ...	...	...	...	...	...	...
Mandarins, per case ...	...	...	...	...	...	...
Oranges (Navel), per case ...	...	...	...	...	...	...
Oranges (Queensland), per case ...	...	...	...	...	...	7s. to 14s.
Papaw Apples, per half-case ...	...	...	...	...	...	6s. to 7s.
Passion Fruit, per half-case ...	...	...	...	...	...	11s. 0d.
Persimmons, per half-case ...	...	...	...	...	...	2s. to 4s.
Pineapples (Queens), per double-case ...	...	...	...	...	...	10s. 0d.
Pineapples (Ripley), per double-case ...	...	...	...	...	...	7s. to 9s.
Quinces, per bushel-case ...	...	...	...	...	...	...
Tomatoes (Queensland), per half-case ...	...	...	...	...	...	2s. to 4s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.						MAY.
						Prices.
Apples, Eating, per case ...	...	...	...	...	...	7s. 6d to 8s. 6d.
Apples, Cooking, per case ...	...	...	...	...	...	7s. to 9s.
Apricots, per case ...	...	...	...	...	...	...
Bananas (Cavendish), per dozen ...	...	...	...	...	...	1½d. to 5d.
Bananas (Sugar), per dozen ...	...	...	...	...	...	4d. to 5½d.
Cape Gooseberries, per small box ...	...	...	...	...	...	5s. to 5s. 6d.
Cherries, per box ...	...	...	...	...	...	...
Citrons, per hundredweight ...	...	...	...	...	...	8s.
Cocoanuts, per sack ...	...	...	...	...	...	15s. to 25s.
Cumquats, per quarter-case ...	...	...	...	...	...	3s. to 3s. 6d.
Custard Apples, per tray ...	...	...	...	...	...	3s. to 4s.
Lemons (Lisbon), per quarter-case ...	...	...	...	...	...	3s. to 6s.
Mandarins, per case ...	...	...	...	...	...	6s. to 9s.
Mangoes, per quarter-case ...	...	...	...	...	...	...
Oranges (Navel), per case ...	...	...	...	...	...	6s. to 8s.
Oranges (Other), per case ...	...	...	...	...	...	2s. 6d. to 4s. 6d.
Oranges, per case ...	...	...	...	...	...	...
Papaw Apples, per quarter-case ...	...	...	...	...	...	2s. to 4s. 6d.
Passion Fruit, per half-bushel case ...	...	...	...	...	...	4s. to 6s.
Peaches, per quarter-case ...	...	...	...	...	...	...
Pears, per half-bushel case ...	...	...	...	...	...	...
Peanuts, per lb. ...	...	...	...	...	...	3½d. to 4d.
Persimmons, per quarter-case ...	...	...	...	...	...	1s. 8d. to 2s. 6d.
Pineapples (Ripley), per case ...	...	...	...	...	...	9s. to 10s.
Pineapples (Rough), per case ...	...	...	...	...	...	1s. to 3s.
Pineapples (Smooth), per case ...	...	...	...	...	...	4s. 6d. to 5s. 6d.
Plums, per quarter-case ...	...	...	...	...	...	...
Rockmelons, per dozen ...	...	...	...	...	...	...
Strawberries, per dozen boxes ...	...	...	...	...	...	...
Rosellas, per sugar bag ...	...	...	...	...	...	2s. 6d. to 3s. 6d.
Tomatoes, per quarter-case ...	...	...	...	...	...	1s. 6d. to 3s. 3d.

TOP PRICES, ENOGGERA YARDS, APRIL, 1918.

Animal.	APRIL.	
	Prices.	
Bullocks	£18 10s. to £23	
Cows	£13 to £15 15s.	
Cows (Single)	...	
Merino Wethers	42s. 3d.	
Crossbred Wethers	38s.	
Merino Ewes	26s. 6d.	
Crossbred Ewes	36s. 3d.	
Lambs	33s. 9d.	
Pigs (Baconers)	...	
Pigs (Porkers)	35s.	
Pigs (Slips)	...	

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF APRIL, 1918, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING APRIL, 1918 AND 1917, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	April.	No. of Years' Records.	April, 1918.	April, 1917.		April.	No. of Years' Records.	April, 1918.	April, 1917.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Asherton	4.25	17	4.37	4.85	Nambour	4.53	22	7.16	2.85
Cairns	11.74	36	8.23	8.95	Nanango	1.89	36	1.33	0.42
Cardwell	9.85	46	7.70	6.04	Rockhampton	2.24	31	3.38	0.82
Cooktown	9.40	42	6.32	6.42	Woodford	4.19	31	2.53	1.13
Herberton	4.35	31	3.31	3.60					
Ingham	8.65	26	8.19	7.98	<i>Darling Downs.</i>				
Innisfail	21.86	37	17.48	13.70					
Mossman	11.78	10	6.82	9.78	Dalby	1.32	48	1.13	1.94
Townsville	3.72	47	2.62	3.25	Emu Vale	1.17	...	2.77	0.29
					Jimbour	1.39	...	1.27	1.24
<i>Central Coast.</i>					Miles	1.47	33	2.16	0.87
Ayr	2.76	31	1.84	2.80	Stanthorpe	1.77	45	1.29	0.37
Bowen	3.04	47	2.27	1.58	Toowoomba	2.54	46	1.58	1.74
Charters Towers	1.73	36	1.02	0.19	Warwick	1.36	31	3.41	0.06
Mackay	6.80	47	9.25	3.27					
Proserpine	6.59	15	8.35	9.44	<i>Maranoa.</i>				
St. Lawrence	2.81	47	7.82	2.17					
					Roma	1.30	44	3.17	0.67
<i>South Coast.</i>									
Biggenden	1.62	...	3.00	0.39	<i>State Farms, &c.</i>				
Bundaberg	2.79	35	4.81	1.99					
Brisbane	3.63	67	1.70	0.75	Bungeworogorai	0.79	4	2.92	0.28
Childers	2.35	23	4.04	1.71	Gatton College	1.83	...	1.63	0.53
Crohamhurst	5.42	25	5.64	2.63	Gindie	1.19	...	2.70	0.04
Esk	2.71	31	1.38	1.73	Hermitage	1.31	...	3.61	...
Gayndah	1.31	47	2.07	0.84	Kairi	3.47	4	4.08	4.09
Gympie	3.09	48	3.17	1.32	Kamerunga	11.98	...	10.26	9.46
Glasshouse M'tains	4.70	10	4.48	2.15	Sugar Experiment				
Kilkivan	2.10	39	1.99	1.03	Station, Mackay	5.13	...	8.42	5.24
Maryborough	3.27	47	3.35	1.21	Warren	0.98	4	2.95	0.51

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for April this year, and for the same period of 1917, having been compiled from telegraphic reports, are subject to revision.

J. H. HARTSHORN, Divisional Officer.

Farm and Garden Notes for July.

FIELD.—The month of July is generally considered the best time to sow lucerne, for the reason that the growth of weeds is then practically checked, and the young lucerne plants will, therefore, not be retarded by them, as would be the case if planted later on in the spring. If the ground has been properly prepared by deep ploughing, cross-ploughing, and harrowing, and an occasional shower occurs to assist germination and growth, the lucerne will thrive so well that by the time weeds once more appear it will be well able to hold its own against them. From 10 to 12 lb. of seed drilled, or 15 to 16 lb. broadcast, will be sufficient for an acre. This is also the time to prepare the land for many field crops, such as potatoes, maize, oats, and barley for green fodder; also, rye, vetches, tobacco, cotton, sugar-cane, field carrots, mangolds, swedes, canaigre, &c. Early potatoes, sugar-cane, and maize may be planted in very early districts, but it is risky to plant potatoes during this month in any districts liable to late frosts or in low-lying ground. Under such conditions, it is far better to wait until well into the following month. The greatest loss in potatoes and sugar-cane has been, on more than one occasion, experienced in September, when heavy frosts occurred in low-lying districts in the Southern portion of the State. During suitable weather, rice may be sown in the North. The coffee crop should now be harvested, and yams and tumeric unearthed.

KITCHEN GARDEN.—Should showery weather be frequent during July, do not attempt to sow seeds on heavy land, as the latter will be liable to clog, and hence be injurious to the young plants as they come up. The soil should not be reworked until fine weather has lasted sufficiently long to make it friable. Never walk over the land during wet weather with a view to sowing. The soil cakes and hardens, and good results cannot then be expected. This want of judgment is the usual cause of hard things being said about the seedsman. In fine weather, get the ground ploughed or dug, and let it lie in the rough till required. If harrowed and pulverised before that time, the growth of weeds will be encouraged, and the soil is deprived of the sweetening influences of the sun, rain, air, and frost. Where the ground has been properly prepared, make full sowings of cabbage, carrot, broad beans, lettuce, parsnips, beans, radishes, leeks, spring onions, beetroot, eschalots, salsify, &c. As westerly winds may be expected, plenty of hoeing and watering will be required to ensure good crops. Pinch the tops of broad beans which are in flower, and stake up peas which require support. Plant out rhubarb, asparagus, and artichokes. In warm districts, it will be quite safe to sow cucumbers, marrows, squashes, and melons during the last week of the month. In colder localities, it is better to wait till the middle or end of August. Get the ground ready for sowing French beans and other spring crops. Sow Guada beans (snake gourd) at the end of September.

FLOWER GARDEN.—Winter work ought to be in an advanced state. The roses will now want looking after. They should already have been pruned, and now any shoots which have a tendency to grow in wrong directions should be rubbed off. Overhaul the ferneries, and top-dress with a mixture of sandy loam and leaf mould, staking up some plants and thinning out others. Treat all classes of plants in the same manner as the roses where undesirable shoots appear. All such work as trimming lawns, digging beds, pruning, and planting should now be got well in hand. Plant out antirrhinums, pansies, hollyhocks, verbenas, petunias, &c., which were lately sown. Sow zinnias, amaranthus, balsam, chrysanthemum tricolor, marigolds, cosmos, coxcombs, phloxes, sweet peas, lupins, &c. Plant gladiolus, tuberose, amaryllis, pan-cratiun, ismene, crinums, belladonna, lily, and other bulbs. Put away dahlia roots in some warm, moist spot, where they will start gently and be ready for planting out in August and September.

Orchard Notes for July.

THE SOUTHERN COAST DISTRICTS.

The notes for the month of June apply to July as well. The first crop of strawberries will be ripening during the month, though extra early fruit is often obtained in June, and sometimes as early as May, under especially favourable conditions. Look out for leaf-blight, and spray for same with Bordeaux mixture, also watch for the first signs of the grey mould that attacks the fruit, and spray with the sulphide of soda wash. The larvæ of the cockchafer, that eats the roots of strawberries, should be looked for, and destroyed whenever found. Pruning of citrus and other fruit trees may be continued; also, the spraying with lime and sulphur. Where the ringing borer, that either attacks the main trunks or the branches at or near where they form the head of the tree, is present, the main stems and trunks should either be painted or sprayed with the lime and sulphur wash during the month, as the mature beetles that lay the eggs that eventually turn to the borers sometimes make their appearance during the month, and unless the trees are protected by the wash they lay the eggs, which hatch out in due course and do a lot of damage. Keep the orchard clean, so that when the spring growth takes place the trees may be in good condition. There is usually a heavy winter crop of pineapples ripening during this and the following month, particularly of smooth leaves. See that any conspicuous fruits are protected by a wisp of grass, as they are injured not only by frost but by cold westerly winds.

THE TROPICAL COAST DISTRICTS.

See the instructions given for the month of June. Keep the orchards clean and well worked. Prune and spray where necessary.

THE SOUTHERN AND CENTRAL TABLELANDS.

Where pruning of deciduous trees has not been completed, do so this month. It is not advisable to leave this work too late in the season, as the earlier the pruning is done after the sap is down the better the buds develop—both fruit buds and wood buds; thus securing a good blossoming and a good growth of wood the following spring.

Planting can be continued during the month; if possible, it should be finished this month, for, though trees can be set out during August, if a dry spell comes they will suffer, when the earlier planted trees, which have had a longer time to become established, will do all right—provided, of course, that the land has been properly prepared prior to planting, and that it is kept in good order by systematic cultivation subsequent to planting.

Do not neglect to cut back hard when planting, as the failure to do so will result in a weakly growth.

As soon as the pruning is completed, the orchards should get their winter spraying with the sulphur limewash, and either with or without salt, as may be wished. See that this spraying is thoroughly carried out, and that every part of the tree is reached, as it is the main treatment during the year for San José and other scale insects, as well as being the best time to spray for all kinds of canker, bark-rot, moss, lichens, &c.

Where the orchard has not been ploughed, get this done as soon as the pruning and spraying are through, so as to have the land in good order for the spring cultivations. See that the work is well done, and remember that the best way to provide against dry spells is to keep moisture in the soil once you have got it there, and this can only be done by thorough and deep working of the soil.

When obtaining trees for planting, see that they are on good roots, and that they are free from all pests, as it is easier to prevent the introduction of pests of all sorts than to eradicate them once they have become established. Only select those varieties that are of proved merit in your district; do not plant every kind of tree that you see listed in a nurseryman's catalogue, as many of them are unsuited to our climate. The pruning of grape vines may be carried out in all parts of the tablelands other than the Stanthorpe district, where it is advisable to leave this work as long as possible, owing to the danger of spring frosts.

Where grape vines have been well started and properly pruned from year to year, this work is simple; but where the vines have become covered with long straggling spurs, and are generally very unsightly, the best plan is to cut them hard back, so as to cause them to throw out good strong shoots near the main stem. These shoots can be laid down in the place of the old wood in following seasons, and the whole bearing portion of the vine will be thus renewed.

Where vineyards have been pruned, the prunings should be gathered and burnt, and the land should receive a good ploughing.

GRADED SEED WHEAT!

HERMITAGE STATE FARM.

The undermentioned graded wheats (1917 Season) are offered for sale at 5/6 per bushel f.o.b. Hermitage.

Intending purchasers are advised that, owing to unfavourable weather conditions during harvesting, the grain is more or less weathered, and not as plump as usual; satisfactory germination tests, however, have been made.

The varieties consist of Hiawatha, Coronation, Piastre, and O.K., and are of Queens' and Origin, and were raised and have been tested over a series of years at Hermitage State Farm, proving to be very suitable to the conditions of soil and climate of the Western Darling Downs.

These varieties are all good Milling Wheats of medium, early-maturing habit, fair rust resisters, and are already well and favourably known to those persons who have given the wheats a trial

ROMA STATE FARM.

BUNGE 1.

Graded Seed Wheat is offered for sale at 5/6 per bushel f.o.b. Bungeworgorai.

This wheat is somewhat weathered, owing to unfavourable conditions prevalent during harvesting, and from the same cause is not as plump as usual.

Applications, accompanied by Cash Remittance, must be addressed in each case to
THE MANAGER.

Orders will be supplied according to priority of application.

CONSIGN—

WOOL

Wool.—Fenwick & Co. have ample storage for wool; and all consignments of wool, whether large or small, will receive their careful attention.

STOCK

Fenwick & Co. sell Cattle, Calves, Pigs, Sheep, and Lambs every Wednesday at Newmarket. Fenwick & Co. have paddocks handy to Untrucking Yards well grassed, naturally well watered, and with plenty of shade.

SKINS

Fenwick & Co. secure full market value for consignments of Hides, Sheepskins, Marsupial and Opossum Skins, Goat Skins, Tallow, Hair, Beeswax, etc.

Skins.—The Season for Opossum Skins is open from the 1st May, 1918, until the 31st October, 1918, but the Season for Bear Skins remains closed until the 30th April, 1919.

TO—

FENWICK & Co., ESTABLISHED 1864,

SALESMEN, EDWARD STREET, BRISBANE,
THEY WILL SECURE FULL MARKET VALUE FOR YOUR CONSIGNMENTS.

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